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BOOK REVIEWS

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OTHER DEPARTMENTS



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ECONOMIC GROWTH AND INCOME INEQUALITY*

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The central theme of this paper is the character and causes of long-term changes in the personal distribution of income. Does inequality in the distribution of income increase or decrease in the course of a country's economic growth? What factors determine the secular level and trends of income inequalities?

These are broad questions in a field of study that has been plagued by looseness in definitions, unusual scarcity of data, and pressures of strongly held opinions. While we cannot completely avoid the resulting difficulties, it may help to specify the characteristics of the size-of-income distributions that we want to examine and the movements of which we want to explain.

Five specifications may be listed. First, the units for which incomes are recorded and grouped should be family-expenditure units, properly adjusted for the number of persons in each—rather than income recipients for whom the relations between receipt and use of income can be widely diverse. Second, the distribution should be complete, *i.e.*, should cover all units in a country rather than a segment either at the upper or lower tail. Third, if possible we should segregate the units whose main income earners are either still in the learning or already in the retired stages of their life cycle—to avoid complicating the picture by including incomes *not* associated with full-time, full-fledged participation in economic activity. Fourth, income should be defined as it is now for national income in this country, *i.e.*, received by individuals, including income in kind, before and after direct taxes, excluding capital gains. Fifth, the units should be grouped by *secular* levels of income, free of cyclical and other transient disturbances.

For such a distribution of mature expenditure units by secular levels

* Presidential address delivered at the Sixty-seventh Annual Meeting of the American Economic Association, Detroit, Michigan, December 29, 1954.

of income per capita, we should measure shares of some fixed ordinal groups—percentiles, deciles, quintiles, etc. In the underlying array the units should be classified by average income levels for a sufficiently long span so that they form income-status groups—say a generation or about 25 years. Within such a period, even when classified by secular income levels, units may shift from one ordinal group to another. It would, therefore, be necessary and useful to study separately the relative share of units that, throughout the generation period of reference, were continuously within a specific ordinal group, and the share of the units that moved into that specific group; and this should be done for the shares of "residents" and "migrants" within all ordinal groups. Without such a long period of reference and the resulting separation between "resident" and "migrant" units at different relative income levels, the very distinction between "low" and "high" income classes loses its meaning, particularly in a study of long-term changes in shares and in inequalities in the distribution. To say, for example, that the "lower" income classes gained or lost during the last twenty years in that their share of total income increased or decreased has meaning only if the units have been classified as members of the "lower" classes throughout those 20 years—and for those who have moved into or out of those classes recently such a statement has no significance.

Furthermore, if one may add a final touch to what is beginning to look like a statistical economist's pipe dream, we should be able to trace secular income levels not only through a single generation but at least through two—connecting the incomes of a given generation with those of its immediate descendants. We could then distinguish units that, throughout a given generation, remain within one ordinal group and whose children—through *their* generation—are also within that group from units that remain within a group through their generation but whose children move up or down on the relative economic scale in their time. The number of possible combinations and permutations becomes large; but it should not obscure the main design of the income structure called for—the classification by long-term income status of a given generation and of its immediate descendants. If living members of society—as producers, consumers, savers, decision-makers on secular problems—react to long-term changes in income levels and shares, data on such an income structure are essential. An economic society can then be judged by the secular level of the income share that it provides for a given generation and for its children. The important corollary is that the study of long-term changes in the income distribution must distinguish between changes in the shares of resident groups—resident within either one or two generations—and changes in the income shares of

groups that, judged by their secular levels, migrate upward or downward on the income scale.

Even if we had data to approximate the income structure just outlined, the broad question posed at the start—how income inequality changes in the process of a country's economic growth—could be answered only for growth under defined economic and social conditions. And, in fact, we shall deal with this question in terms of the experience of the now developed countries which grew under the aegis of the business enterprise. But even with this limitation, there are no statistics that can be used directly for the purpose of measuring the *secular* income structure. Indeed, I have difficulty in visualizing how such information could practicably be collected—a difficulty that may be due to lack of familiarity with the studies of our colleagues in demography and sociology who have concerned themselves with problems of generation or intergeneration mobility and status. But although we now lack data directly relevant to the secular income structure, the setting up of reasonably clear and yet difficult specifications is not merely an exercise in perfectionism. For if these specifications do approximate, and I trust that they do, the real core of our interest when we talk about shares of economic classes or long-term changes in these shares, then proper disclosure of our meaning and intentions is vitally useful. It forces us to examine and evaluate critically the data that are available; it prevents us from jumping to conclusions based on these inadequate data; it reduces the loss and waste of time involved in mechanical manipulations of the type represented by Pareto-curve-fitting to groups of data whose meaning, in terms of income concept, unit of observation, and proportion of the total universe covered, remains distressingly vague; and most important of all, it propels us toward a deliberate construction of testable bridges between the available data and the income structure that is the real focus of our interest.

I. *Trends in Income Inequality*

Forewarned of the difficulties, we turn now to the available data. These data, even when relating to complete populations, invariably classify units by income for a given year. From our standpoint, this is their major limitation. Because the data often do not permit many size-groupings, and because the difference between annual income incidence and longer-term income status has less effect if the number of classes is small and the limits of each class are wide, we use a few wide classes. This does not resolve the difficulty; and there are others due to the scantiness of data for long periods, inadequacy of the unit used—which is, at best, a family and very often a reporting unit—errors in the

data, and so on through a long list. Consequently, the trends in the income structure can be discerned but dimly, and the results considered as preliminary informed guesses.

The data are for the United States, England, and Germany—a scant sample, but at least a starting point for some inferences concerning long-term changes in the presently developed countries. The general conclusion suggested is that the relative distribution of income, as measured by annual income incidence in rather broad classes, has been moving toward equality—with these trends particularly noticeable since the 1920's but beginning perhaps in the period before the first world war.

Let me cite some figures, all for income before direct taxes, in support of this impression. In the United States, in the distribution of income among families (excluding single individuals), the shares of the two lowest quintiles rise from 13½ per cent in 1929 to 18 per cent in the years after the second world war (average of 1944, 1946, 1947, and 1950); whereas the share of the top quintile declines from 55 to 44 per cent, and that of the top 5 per cent from 31 to 20 per cent. In the United Kingdom, the share of the top 5 per cent of units declines from 46 per cent in 1880 to 43 per cent in 1910 or 1913, to 33 per cent in 1929, to 31 per cent in 1938, and to 24 per cent in 1947; the share of the lower 85 per cent remains fairly constant between 1880 and 1913, between 41 and 43 per cent, but then rises to 46 per cent in 1929 and 55 per cent in 1947. In Prussia income inequality increases slightly between 1875 and 1913—the shares of the top quintile rising from 48 to 50 per cent, of the top 5 per cent from 26 to 30 per cent; the share of the lower 60 per cent, however, remains about the same. In Saxony, the change between 1880 and 1913 is minor: the share of the two lowest quintiles declines from 15 to 14½ per cent; that of the third quintile rises from 12 to 13 per cent, of the fourth quintile from 16½ to about 18 per cent; that of the top quintile declines from 56½ to 54½ per cent, and of the top 5 per cent from 34 to 33 per cent. In Germany as a whole, relative income inequality drops fairly sharply from 1913 to the 1920's, apparently due to decimation of large fortunes and property incomes during the war and inflation; but then begins to return to prewar levels during the depression of the 1930's.[1]

[1] The following sources were used in calculating the figures cited.

United States. For recent years we used *Income Distribution by Size, 1944-1950* (Washington, 1953) and Selma Goldsmith and others, "Size Distribution of Income Since the Mid-Thirties," *Rev. Econ Stat*, Feb 1954, XXXVI, 1-32; for 1929, the Brookings Institution data as adjusted in Simon Kuznets, *Shares of Upper Groups in Income and Savings* (New York, 1953), p. 220

United Kingdom. For 1938 and 1947, Dudley Seers, The *Levelling of Income Since 1938*

Even for what they are assumed to represent, let alone as approximations to shares in distributions by secular income levels, the data are such that differences of two or three percentage points cannot be assigned significance. One must judge by the general weight and consensus of the evidence—which unfortunately is limited to a few countries. It justifies a tentative impression of constancy in the relative distribution of income before taxes, followed by some narrowing of relative income inequality after the first world war—or earlier.

Three aspects of this finding should be stressed. First, the data are for income before direct taxes and exclude contributions by government (*e.g.*, relief and free assistance). It is fair to argue that both the proportion and progressivity of direct taxes and the proportion of total income of individuals accounted for by government assistance to the less privileged economic groups have grown during recent decades. This is certainly true of the United States and the United Kingdom, but in the case of Germany is subject to further examination. It follows that the distribution of income after direct taxes and including free contributions by government would show an even greater narrowing of inequality in developed countries with size distributions of pretax, ex-government-benefits income similar to those for the United States and the United Kingdom.

Second, such stability or reduction in the inequality of the percentage shares was accompanied by significant rises in real income per capita. The countries now classified as developed have enjoyed rising per capita incomes except during catastrophic periods such as years of active world conflict. Hence, if the shares of groups classified by their annual income position can be viewed as approximations to shares of groups classified by their secular income levels, a constant percentage share of a given group means that its per capita real income is rising at the same rate as the average for all units in the country; and a reduction in inequality of the shares means that the per capita income of the lower-income groups is rising at a more rapid rate than the per capita income of the upper-income groups.

The third point can be put in the form of a question. Do the distribu-

(Oxford, 1951) p. 39; for 1929, Colin Clark, *National Income and Outlay* (London, 1937) Table 47, p. 109; for 1880, 1910, and 1913, A Bowley, *The Change in the Distribution of the National Income, 1880-1913* (Oxford, 1920)

Germany. For the constituent areas (Prussia, Saxony and others) for years before the first world war, based on S Prokopovich, *National Income of Western European Countries* (published in Moscow in the 1920's). Some summary results are given in Prokopovich, "The Distribution of National Income," *Econ. Jour.*, March 1926, XXXVI, 69-82. See also, "Das Deutsche Volkseinkommen vor und nach dem Kriege," *Einzelschrift zur Stat. des Deutschen Reichs*, no. 24 (Berlin, 1932), and W. S. and E. S. Woytinsky, *World Population and Production* (New York, 1953) Table 192, p. 709.

tions by annual incomes properly reflect trends in distribution by secular incomes? As technology and economic performance rise to higher levels, incomes are less subject to transient disturbances, not necessarily of the cyclical order that can be recognized and allowed for by reference to business cycle chronology, but of a more irregular type. If in the earlier years the economic fortunes of units were subject to greater vicissitudes—poor crops for some farmers, natural calamity losses for some nonfarm business units—if the over-all proportion of individual entrepreneurs whose incomes were subject to such calamities, more yesterday but some even today, was larger in earlier decades, these earlier distributions of income would be more affected by transient disturbances. In these earlier distributions the temporarily unfortunate might crowd the lower quintiles and depress their shares unduly, and the temporarily fortunate might dominate the top quintile and raise its share unduly—proportionately more than in the distributions for later years. If so, distributions by longer-term average incomes might show less reduction in inequality than do the distributions by annual incomes; they might even show an opposite trend.

One may doubt whether this qualification would upset a narrowing of inequality as marked as that for the United States, and in as short a period as twenty-five years. Nor is it likely to affect the persistent downward drift in the spread of the distributions in the United Kingdom. But I must admit a strong element of judgment in deciding how far this qualification modifies the finding of long-term stability followed by reduction in income inequality in the few developed countries for which it is observed or is likely to be revealed by existing data. The important point is that the qualification is relevant; it suggests need for further study if we are to learn much from the available data concerning the secular income structure; and such study is likely to yield results of interest in themselves in their bearing upon the problem of trends in temporal instability of income flows to individual units or to economically significant groups of units in different sectors of the national economy

II. *An Attempt at Explanation*

If the above summary of trends in the secular income structure of developed countries comes perilously close to pure guesswork, an attempt to explain these dimly discernible trends may surely seem foolhardy. Yet it is necessary to do so if only to bring to the surface some factors that may have been at play; induce a search for data bearing upon these factors; and thus confirm or revise our impressions of the trends themselves. Such preliminary speculations are useful

provided it is recognized that we are at a relatively early stage in a long process of interplay among tentative summaries of evidence, preliminary hypotheses, and search for additional evidence that might lead to reformulation and revisions—as bases for new analysis and further search.

The present instalment of initial speculation may be introduced by saying that a long-term constancy, let alone reduction, of inequality in the secular income structure is a puzzle. For there are at least two groups of forces in the long-term operation of developed countries that make for *increasing* inequality in the distribution of income before taxes and excluding contributions by governments. The first group relates to the concentration of savings in the upper-income brackets. According to all recent studies of the apportionment of income between consumption and savings, only the upper-income groups save; the total savings of groups below the top decile are fairly close to zero. For example, the top 5 per cent of units in the United States appear to account for almost two-thirds of individuals' savings; and the top decile comes close to accounting for all of it. What is particularly important is that the inequality in distribution of savings is greater than that in the distribution of property incomes, and hence of assets.[3] Granted that this finding is based on distribution of annual income, and that a distribution by secular levels would show less inequality in income and correspondingly less concentration of savings, the inequality in savings would still remain fairly sharp, perhaps more so than in holdings of assets. Other conditions being equal, the cumulative effect of such inequality in savings would be the concentration of an *increasing* proportion of income-yielding assets in the hands of the upper groups—a basis for larger income shares of these groups and their descendants.

The second source of the puzzle lies in the industrial structure of the income distribution. An invariable accompaniment of growth in developed countries is the shift away from agriculture, a process usually referred to as industrialization and urbanization. The income distribution of the total population, in the simplest model, may therefore be viewed as a combination of the income distributions of the rural and of the urban populations. What little we know of the structures of these two component income distributions reveals that: (a) the average per capita income of the rural population is usually lower than that of the urban;[4] (b) inequality in the percentage shares within the

[3] See Kuznets, *op. cit.*, particularly Chapters 2 and 6

[4] The lower level of per capita income of the agricultural or rural population compared with that of urban is fairly well established, for this country by states, and for many

distribution for the rural population is somewhat narrower than in that for the urban population—even when based on annual income; and this difference would probably be wider for distributions by secular income levels.[4] Operating with this simple model, what conclusions do we reach? First, all other conditions being equal, the increasing weight of urban population means an increasing share for the more unequal of the two component distributions. Second, the relative difference in per capita income between the rural and urban populations does not necessarily drift downward in the process of economic growth: indeed, there is some evidence to suggest that it is stable at best, and tends to widen because per capita productivity in urban pursuits increases more rapidly than in agriculture. If this is so, inequality in the total income distribution should increase.

Two questions then arise: First, why does the share of the top-income groups show no rise over time if the concentration of savings has a cumulative effect? Second, why does income inequality decline and particularly why does the share of the lower-income groups rise if both the weight of the more unequal urban income distribution and the relative difference between per capita urban and per capita rural incomes increase?

The first question has been discussed elsewhere, although the results are still preliminary hypotheses,[5] and it would be impossible to do more here than summarize them briefly.

Factors Counteracting the Concentration of Saving

One group of factors counteracting the cumulative effect of con-

other countries (see, *e.g.*, a summary table of closely related measures of product and
workers engaged, for various divisions of the productive system, in Colin Clark, *Conditions*
of Economic Progress, 2nd ed [London 1951], pp. 316-18). The same table suggests, for
the countries with sufficiently long records, a stable or increasing relative difference between
per-worker product in agriculture and per-worker product in other sectors of the economy

[4] This is true of the U S distributions prior to the second world war (see sources cited
in footnote 1), in the years after the second world war the difference seems to have disap-
peared. It is true of the distributions for Prussia, cited by Prokopovich, and most conspicu-
ous for India today as shown in the rough distributions by M Mukherjee and A K. Ghosh
in "The Pattern of Income and Expenditures in the Indian Union: A Tentative Study,"
International Statistical Conferences, December 1951, Calcutta, India, Part III, pp 49-68.

[5] Some elements of the discussion appeared in "Proportion of Capital Formation to Na-
tional Product," a paper submitted to the annual meeting of the American Economic Associ-
ation in 1951 and published in *Am. Econ Rev.*, Proceedings, May 1952, XLII, 507-26. A
more elaborate statement is presented in "International Differences in Capital Formation
and Financing" (particularly Appendix C, Levels and Trends in Income Shares of Upper
Income Groups), a paper submitted to a Conference on Capital Formation and Economic
Growth held in 1953 under the auspices of the Universities-National Bureau Committee
for Economic Research. It is now in press as part of the volume of proceedings of that
conference.

centration of savings upon upper-income shares is legislative interference and "political" decisions. These may be aimed at limiting the cumulation of property directly through inheritance taxes and other explicit capital levies. They may produce similar effects indirectly, *e.g.*, by government-permitted or -induced inflation which reduces the economic value of accumulated wealth stored in fixed-price securities or other properties not fully responsive to price changes; or by legal restriction of the *yield* on accumulated property, as happened recently in the form of rent controls or of artificially low long-term interest rates maintained by the government to protect the market for its own bonds.

To discuss this complex of processes is beyond the competence of this paper, but its existence and possible wide effect should be noted and one point emphasized. All these interventions, even when not directly aimed at limiting the effects of accumulation of past savings in the hands of the few, do reflect the view of society on the long-term utility of wide income inequalities. This view is a vital force that would operate in democratic societies even if there were no other counteracting factors. This should be borne in mind in connection with *changes* in this view even in developed countries, which result from the process of growth and constitute a re-evaluation of the need for income inequalities as a source of savings for economic growth. The result of such changes would be an increasing pressure of legal and political decisions on upper-income shares—increasing as a country moves to higher economic levels.

We turn to three other, less obvious groups of factors countervailing the cumulative effects of concentration of savings. The first is demographic. In the presently developed countries there have been differential rates of increase between the rich and the poor—family control having first spread to the former. Hence, even disregarding migration, one can argue that the top 5 per cent of 1870 and its descendants would account for a significantly smaller percentage of the population in 1920. This is even more likely in a country like the United States with its substantial immigration—usually entering the income distribution at the lower-income levels; and may be less likely in a country from which the poor have emigrated. The top 5 per cent of population in 1920 is, therefore, comprised only partly of the descendants of the top 5 per cent of 1870; perhaps half or a larger fraction must have originated in the lower-income brackets of 1870. This means that the period during which effects of concentration of savings can be assumed to have cumulated to raise the income share of any given fixed ordinal group (whether it be the top 1, 5, or 10 per cent of the population) is much shorter than the fifty years in the span; and hence these effects are much weaker than they would have

been if the top 5 per cent of 1870 had, through their descendants, filled completely the ranks of the top 5 per cent of the population of 1920. Although the cumulative effect of savings may be to raise the relative income of a *progressively diminishing* top proportion of total population, their effect on the relative share of a *fixed* top proportion of the population is much reduced.

The second group of forces resides in the very nature of a dynamic economy with relative freedom of individual opportunity. In such a society technological change is rampant and property assets that originated in older industries almost inevitably have a diminishing proportional weight in the total because of the more rapid growth of younger industries. Unless the descendants of a high-income group manage to shift their accumulating assets into new fields and participate with new entrepreneurs in the growing share of the new and more profitable industries, the long-range returns on their property holdings are likely to be significantly lower than those of the more recent entrants into the class of substantial asset holders. "From shirt-sleeves to shirt-sleeves in three generations" probably exaggerates the effects of this dynamism of a growing economy: there are, among the upper-income groups of today, many descendants of the upper-income groups of more than three or even four generations ago. But the adage is realistic in the sense that a *long unbroken* sequence of connection with rising industries and hence with major sources of continued large property incomes is exceedingly rare; that the successful great entrepreneurs of today are rarely sons of the great and successful entrepreneurs of yesterday.

The third group of factors is suggested by the importance, even in the upper-income brackets, of service income. At any given time, only a limited part of the income differential of a top group is accounted for by the concentration of property yields: much of it comes from the high level of service income (professional and entrepreneurial earnings and the like). The secular rise in the upper incomes due to this source is likely to be less marked than in the service incomes of lower brackets, and for two somewhat different reasons. First, in so far as high levels of service incomes of given upper units are due to individual excellence (as is true of many professional and entrepreneurial pursuits), there is much less incentive for and possibility of keeping such incomes at continued high relative levels. Hence, the service incomes of the descendants of an *initially high* level unit are not likely to show as strong an upward trend as the incomes for the large body of population at lower-income levels. Second, a substantial part of the rising trend in per capita income is due to interindustry shift, *i.e.*, a shift of workers from lower-income to higher-income industries. The possibilities of rise

due to such interindustry shifts in the service incomes of the initially high-income groups are much more limited than for the population as a whole: they are already in high-income occupations and industries and the range for them toward higher paid occupations is more narrowly circumscribed.

These three groups of factors, even disregarding such legislative and political intervention as is indicated above, are all characteristics of a dynamic growing economy. The differentials in rate of natural increase between the upper- and the lower-income groups are true only of a rapidly growing population—with or without immigration—but accompanied by declining death rates and declining birth rates, a demographic pattern associated in the past only with the growing Western economies. The impact of new industries on obsolescence of already established wealth as a source of property income is clearly a function of rapid growth, and the more rapid the growth the greater the impact will be. The effect of interindustry shifts on the rise of per capita income, particularly of lower-income groups, is also a function of growth since only in a growing economy is there much shift in the relative importance of the several industrial sectors. One can then say, in general, that the basic factor militating against the rise in upper-income shares that would be produced by the cumulative effects of concentration of savings, is the dynamism of a growing and free economic society.

Yet while the discussion answers the original question, it yields no determinate answer as to whether the trend in income shares of upper groups is upward, downward, or constant. Even for the specific question discussed, a determinate answer depends upon the relative balance of factors—continuous concentration of savings making for an increasing share, and the offsetting forces tending to cancel this effect. To tell what the trend of upper-income shares is likely to be, we need to know much more about the weights of these conflicting pressures. Moreover, the discussion has brought to the surface factors that, in and of themselves, may cause either an upward or a downward trend in the share of upper-income groups and hence in income inequality—in distributions of annual or of secular income. For example, the new entrants into the upper groups—the upward "migrants"—who rise either because of exceptional ability or attachment to new industries or for a variety of other reasons—may be entering the fixed upper group of say the top 5 per cent with an income differential—either annual or long-term—that may be relatively *greater* than that of entrants in the preceding generation. Nothing in the argument so far excludes this possibility—which would mean a rise in the share of upper-income groups, even if the share of the old "resident" part remains constant or

even declines. Even disregarding other factors that will be noted in the next section, no firm conclusion as to trends of upper-income shares can be derived from the bare model discussed. Search for further data might yield evidence that would permit a reasonably rough but determinate conclusion; but I have no such evidence at hand.

The Shift from Agricultural to Nonagricultural Sectors

What about the trend toward greater inequality due to the shift from the agricultural to the nonagricultural sectors? In view of the importance of industrialization and urbanization in the process of economic growth, their implications for trends in the income distribution should be explored—even though we have neither the necessary data nor a reasonably complete theoretical model.

The implications can be brought out most clearly with the help of a numerical illustration (see Table I). In this illustration we deal with two sectors: agriculture (A) and all others (B). For each sector we assume percentage distributions of total sector income among sector deciles: one distribution (E) is of moderate inequality, with the shares starting at 5.5 per cent for the lowest decile and rising 1 percentage point from decile to decile to reach 14.5 per cent for the top decile; the other distribution (U) is much more unequal, the shares starting at 1 per cent for the lowest decile, and rising 2 percentage points from decile to decile to reach 19 per cent for the top decile. We assign per capita incomes to each sector: 50 units to A and 100 units to B in case I (lines 1-10 in the illustration): 50 to A and 200 to B in case II (lines *11-20*). Finally, we allow the proportion of the numbers in sector A in the total number to decline from 0.8 to 0.2.

The numerical illustration is only a partial summary of the calculations, showing the shares of the lowest and highest quintiles in the income distribution for the total population under different assumptions.[6] The basic assumptions used throughout are that the per capita income of sector B (nonagricultural) is always higher than that of sector A; that the proportion of sector A in the total number declines; and that the inequality of the income distribution within sector A may be as wide as that within sector B but not wider. With the assumptions con-

[6] The underlying calculations are quite simple For each case we distinguish 20 cells within the total distribution—sets of ten deciles for each sector For each cell we compute the percentage shares of both number and income in the number and income of total population, and hence also the relative per capita income of each cell. The cells are then arrayed in increasing order of their relative per capita income and cumulated. In the resulting cumulative distributions of number and countrywide income we establish, by arithmetic interpolation, if interpolation is needed, the percentage shares in total income of the successive quintiles of the country's population.

TABLE I.—PERCENTAGE SHARES OF 1ST AND 5TH QUINTILES IN THE INCOME DISTRIBUTION FOR TOTAL POPULATION UNDER VARYING ASSUMPTIONS CONCERNING PER CAPITA INCOME WITHIN THE SECTORS, PROPORTIONS OF SECTORS IN TOTAL NUMBER, AND INTRASECTOR INCOME DISTRIBUTIONS

	Proportion of Number in Sector A to Total Number						
	0.8 (1)	0.7 (2)	0.6 (3)	0.5 (4)	0.4 (5)	0.3 (6)	0.2 (7)
I. Per Capita Income of Sector A = 50; of Sector B = 100							
1. Per capita income of total population	60	65	70	75	80	85	90
Distribution (*E*) for Both Sectors							
2. Share of 1st quintile	10.5	9.9	9.6	9.3	9.4	9.8	10.2
3. Share of 5th quintile	34.2	35.8	35.7	34.7	33.2	31.9	30.4
4. Range (3-2)	23.7	25.9	26.1	25.3	23.9	22.1	20.2
Distribution (*U*) for Both Sectors							
5. Share of 1st quintile	3.8	3.8	3.7	3.7	3.8	3.8	3.9
6. Share of 5th quintile	40.7	41.9	42.9	42.7	41.5	40.2	38.7
7. Range (6-5)	36.8	38.1	39.1	39.0	37.8	36.4	34.8
Distribution (*E*) for Sector A, (*U*) for Sector B							
8. Share of 1st quintile	9.3	8.3	7.4	6.7	6.0	5.4	4.9
9. Share of 5th quintile	37.7	41.0	42.9	42.7	41.5	40.2	38.7
10. Range (9-8)	28.3	32.7	35.4	36.0	35.5	34.8	33.8
I. Per Capita Income of Sector A = 50; of Sector B = 200							
11. Per capita income of total population	80	95	110	125	140	155	170
Distribution (*E*) for Both Sectors							
12. Share of 1st quintile	7.9	6.8	6.1	5.6	5.4	5.4	5.9
13. Share of 5th quintile	50.0	49.1	45.5	41.6	38.0	35.0	32.2
14. Range (13-12)	42.1	42.3	39.4	36.0	32.6	29.6	26.3
Distribution (*U*) for Both Sectors							
15. Share of 1st quintile	3.1	2.9	2.7	2.6	2.6	2.7	3.1
16. Share of 5th quintile	52.7	56.0	54.5	51.2	47.4	44.1	40.9
17. Range (16-15)	49.6	53.1	51.8	48.6	44.8	41.4	37.9
Distribution (*E*) for Sector A, (*U*) for Sector B							
18. Share of 1st quintile	7.4	6.2	5.4	4.7	4.2	3.9	3.8
19. Share of 5th quintile	51.6	56.0	54.6	51.2	47.4	44.1	40.9
20. Range (19-18)	44.2	49.8	49.2	46.5	43.2	40.2	37.2

For methods of calculating the shares of quintiles, see text (p. 12 and fn 6). Some differences ill not check because of rounding.

:erning three sets of factors—intersector differences in per capita in- :ome, intrasector distributions, and sector weights—varying within the imitations just indicated, the following conclusions are suggested:

First, if the per capita income differential increases, or if the income distribution is more unequal for sector B than for sector A, or if both conditions are present, the rise over time in the relative weight of sector B causes a marked increase in inequality in the countrywide income distribution. We have here a demonstration of the effects upon trends in income inequality of interindustry shifts away from agriculture discussed above (pp. 7-8).

Second, if the intrasector income distribution is the same for both sectors, and the widening inequality in the countrywide income distribution is due only to the increasing per capita income differential in favor of sector B, such widening is greater when the intrasector income distributions are characterized by moderate rather than wide inequality. Thus, if the intrasector distributions are of the *E* type, the range in the countrywide distribution widens from 23.7 to 26.3 as proportion of A drops from 0.8 to 0.2 and as the ratio of per capita income of sector B to that of sector A changes from 2 to 4 (see line 4, col. 1, and line 14, col. 7). If the *U* distributions are used, the range, under identical conditions, widens only from 36.8 to 37.9 (see line 7, col. 1, and line 17, col. 7). This difference is revealed more clearly by the change in the share of the 1st quintile, which bears the brunt of widening inequality: for the *E* distribution, the share drops from 10.5 (line 2, col. 1) to 5.9 (line 12, col. 7); for the *U* distribution, from 3.8 (line 5, col. 1) to 3.1 (line 15, col. 7).

Third, if the per capita income differential between sectors is constant, but the intrasector distribution of B is more unequal than that of A, the widening inequality in the countrywide distribution is the greater, the lower the assumed per capita income differential. Thus for a differential of 2 to 1, the range widens from 28.3 when the proportion of A is 0.8 (line 10, col 1) to 36.0 at the peak when the proportion of A is 0.5 (line 10 col. 4) and is still 33.8 when the proportion of A drops to 0.2 (line 10, col. 7). For a per capita income differential of 4 to 1, the widening of the range at the maximum is only from 44.2 (line 20, col. 1) to 49.8 (line 20, col. 2) and then the range declines to 37.2 (line 20, col. 7), well below the initial level.

Fourth, the assumptions utilized in the numerical illustration—of a rise in proportions of total number in section B, of greater inequality in the distribution within sector B, and of the growing excess of per capita income in B over that in A—yield a decline in the share of the 1st quintile that is much more conspicuous than the rise in the share of the 5th quintile. Thus the share of the 1st quintile, with the proportion of A at 0.8, distribution in B more unequal than in A, and a per capita income differential of 2 to 1, is 9.3 (line 8, col. 1). As we shift to a proportion of A of 0.2, and a per capita income differential of 4 to 1, the

share of the 1st quintile drops to 3.8 (line 18, col. 7). Under the same conditions, the share of the 5th quintile changes from 37.7 (line 9, col. 1) to 40.9 (line 19, col. 7).

Fifth, even if the differential in per capita income between the two sectors remains constant and the intrasector distributions are identical for the two sectors, the mere shift in the proportions of numbers produces slight but significant changes in the distribution for the country as a whole. In general, as the proportion of A drifts from 0.8 downwards, the range tends first to widen and then to diminish. When the per capita income differential is low (2 to 1), the widening of the range reaches a peak close to middle of the series, *i.e.*, at a proportion of A equal to 0.6 (lines 4 and 7); and the movements in the range tend to be rather limited. When the per capita income differential is large (4 to 1), the range contracts as soon as the proportion of A passes the level of 0.7, and the decline in the range is quite substantial (lines 14 and 17).

Sixth, of particular bearing upon the shares of upper-income groups is the finding that the share of the top quintile declines as the proportion of A falls below a certain, rather high fraction of total numbers. There is not a single case in the illustration in which the share of the 5th quintile fails to decline, either throughout or through a substantial segment of the sequence in the downward movement of the proportion of A from 0.8 to 0.2. In lines 6 and 9, the share of the 5th quintile declines beyond the point at which the proportion of A is 0.6; and in all other relevant lines the downward trend in the share of the 5th quintile sets in earlier. The reason lies, of course, in the fact that with increasing industrialization, the growing weight of the nonagricultural sector, with its higher per capita income, raises the per capita income for the whole economy; and yet per capita income within each sector and the intrasector distributions are kept constant. Under such conditions, the upper shares would fail to decline only if there were either a greater rise in per capita income of sector B than in that of sector A; or increasing inequality in the intrasector distribution of sector B.

Several other conjectural conclusions could be drawn with additional variations in assumptions, and multiplication of sectors beyond the two distinguished in the numerical illustration. But even in the simple model illustrated the variety of possible patterns is impressive; and one is forced to the view that much more empirical information is needed to permit a proper choice of specific assumptions and constants. Granted that several of the conclusions could be generalized in formal mathematical terms, useful inferences would be within our reach only if we knew more about the specific sector distributions and the levels and trends in per capita income differentials among the sectors.

If then we limit ourselves to what is known or can be plausibly as-

sumed, the following inferences can be suggested. We know that per capita income is greater in sector B than in sector A; that, at best, the per capita income differential between sectors A and B has been fairly constant (*e.g.*, in the United States) and has perhaps more often increased; that the proportion of sector A in total numbers has diminished. Then, if we start with intrasector distribution of B more unequal than for A, we would expect results suggested by either lines 8-10 or 18-20. In the former case, the range widens as the proportion of A drops from 0.8 to 0.5, and then narrows. In the latter case, the range declines beyond the point at which the proportion of A is 0.7. But in both cases, the share of the 1st quintile declines, and fairly appreciably and continuously (see lines 8 and 18). The magnitude and continuity of the decline are partly the result of the specific assumptions made; but one would be justified in arguing that within the broad limits suggested by the illustration, the assumption of greater inequality in the intrasector distribution for sector B than for sector A, yields a downward trend in the share of the lower-income groups. Yet we find no such trend in the empirical evidence that we have. Can we assume that in the earlier periods the internal distribution for sector B was not more unequal than for sector A, despite the more recent indications that urban income distribution is more unequal than the rural?

There is, obviously, room for conjecture. It seems most plausible to assume that in earlier periods of industrialization, even when the nonagricultural population was still relatively small in the total, its income distribution was more unequal than that of the agricultural population. This would be particularly so during the periods when industrialization and urbanization were proceeding apace and the urban population was being swelled, and fairly rapidly, by immigrants—either from the country's agricultural areas or from abroad. Under these conditions, the urban population would run the full gamut from low-income positions of recent entrants to the economic peaks of the established top-income groups. The urban income inequalities might be assumed to be far wider than those for the agricultural population which was organized in relatively small individual enterprises (large-scale units were rarer then than now).

If we grant the assumption of wider inequality of distribution in sector B, the shares of the lower-income brackets should have shown a downward trend. Yet the earlier summary of empirical evidence indicates that during the last 50 to 75 years there has been no widening in income inequality in the developed countries but, on the contrary, some narrowing within the last two to four decades. It follows that the intrasector distribution—either for sector A or for sector B—must have shown sufficient narrowing of inequality to offset the increase called

for by the factors discussed. Specifically, the shares of the *lower* income groups in sectors A and/or B must have increased sufficiently to offset the decline that would otherwise have been produced by a combination of the elements shown in the numerical illustration.

This narrowing in inequality, the offsetting rise in the shares of the lower brackets, most likely occurred in the income distribution for the urban groups, in sector B. While it may also have been present in sector A, it would have had a more limited effect on the inequality in the countrywide income distribution because of the rapidly diminishing weight of sector A in the total. Nor was such a narrowing of income inequality in agriculture likely: with industrialization, a higher level of technology permitted larger-scale units and, in the United States for example, sharpened the contrast between the large and successful business farmers and the subsistence sharecroppers of the South. Furthermore, since we accept the assumption of *initially* narrower inequality in the internal distribution of income in sector A than in sector B, any significant reduction in inequality in the former is less likely than in the latter.

Hence we may conclude that the major offset to the widening of income inequality associated with the shift from agriculture and the countryside to industry and the city must have been a rise in the income share of the lower groups within the nonagricultural sector of the population. This provides a lead for exploration in what seems to me a most promising direction: consideration of the pace and character of the economic growth of the urban population, with particular reference to the relative position of lower-income groups. Much is to be said for the notion that once the early turbulent phases of industrialization and urbanization had passed, a variety of forces converged to bolster the economic position of the lower-income groups within the urban population. The very fact that after a while, an increasing proportion of the urban population was "native," *i.e.*, born in cities rather than in the rural areas, and hence more able to take advantage of the possibilities of city life in preparation for the economic struggle, meant a better chance for organization and adaptation, a better basis for securing greater income shares than was possible for the newly "immigrant" population coming from the countryside or from abroad. The increasing efficiency of the older, established urban population should also be taken into account. Furthermore, in democratic societies the growing political power of the urban lower-income groups led to a variety of protective and supporting legislation, much of it aimed to counteract the worst effects of rapid industrialization and urbanization and to support the claims of the broad masses for more adequate shares of the growing income of the country. Space does not permit the discussion of demographic, political, and social considerations that could be brought

to bear to explain the offsets to any declines in the shares of the lower groups, declines otherwise deducible from the trends suggested in the numerical illustration.

III. *Other Trends Related to Those in Income Inequality*

One aspect of the conjectural conclusion just reached deserves emphasis because of its possible interrelation with other important elements in the process and theory of economic growth. The scanty empirical evidence suggests that the narrowing of income inequality in the developed countries is relatively recent and probably did not characterize the earlier stages of their growth. Likewise, the various factors that have been suggested above would explain stability and narrowing in income inequality in the later rather than in the earlier phases of industrialization and urbanization. Indeed, they would suggest widening inequality in these early phases of economic growth, especially in the older countries where the emergence of the new industrial system had shattering effects on long-established pre-industrial economic and social institutions. This timing characteristic is particularly applicable to factors bearing upon the lower-income groups: the dislocating effects of the agricultural and industrial revolutions, combined with the "swarming" of population incident upon a rapid decline in death rates and the maintenance or even rise of birth rates, would be unfavorable to the relative economic position of lower-income groups. Furthermore, there may also have been a preponderance in the earlier periods of factors favoring maintenance or increase in the shares of top-income groups: in so far as their position was bolstered by gains arising out of new industries, by an unusually rapid rate of creation of new fortunes, we would expect these forces to be relatively stronger in the early phases of industrialization than in the later when the pace of industrial growth slackens.

One might thus assume a long swing in the inequality characterizing the secular income structure: widening in the early phases of economic growth when the transition from the pre-industrial to the industrial civilization was most rapid, becoming stabilized for a while, and then narrowing in the later phases. This long secular swing would be most pronounced for older countries where the dislocation effects of the earlier phases of modern economic growth were most conspicuous; but it might be found also in the "younger" countries like the United States, if the period preceding marked industrialization could be compared with the early phases of industrialization, and if the latter could be compared with the subsequent phases of greater maturity.

If there is some evidence for assuming this long swing in relative inequality in the distribution of income before direct taxes and exclud-

ing free benefits from government, there is surely a stronger case for assuming a long swing in inequality of income net of direct taxes and including government benefits. Progressivity of income taxes and, indeed, their very importance characterize only the more recent phases of development of the presently developed countries; in narrowing income inequality they must have accentuated the downward phase of the long swing, contributing to the reversal of trend in the secular widening and narrowing of income inequality.

No adequate empirical evidence is available for checking this conjecture of a long secular swing in income inequality;[7] nor can the phases be dated precisely. However, to make it more specific, I would place the early phase in which income inequality might have been widening, from about 1780 to 1850 in England; from about 1840 to 1890, and particularly from 1870 on in the United States; and, from the 1840's to the 1890's in Germany. I would put the phase of narrowing income inequality somewhat later in the United States and Germany than in England—perhaps beginning with the first world war in the former and in the last quarter of the 19th century in the latter.

Is there a possible relation between this secular swing in income inequality and the long swing in other important components of the growth process? For the older countries a long swing is observed in the rate of growth of population—the upward phase represented by acceleration in the rate of growth reflecting the early reduction in the death rate which was not offset by a decline in the birth rate (and in some cases was accompanied by a rise in the birth rate); and the downward phase represented by a shrinking in the rate of growth reflecting the more pronounced downward trend in the birth rate. Again, in the older countries, and also perhaps in the younger, there may have been a secular swing in the rate of urbanization, in the sense that the proportional additions to urban population and the measures of internal migration that produced this shift of population probably increased for a while—from the earlier much lower levels; but then tended to diminish as urban population came to dominate the country and as the rural reservoirs of migration became proportionally much smaller. For old, and perhaps for young countries also, there must have been a secular swing in the proportions of savings or capital formation to total economic product. Per capita product in pre-industrial times was not large enough to permit as high a nationwide rate of saving or capital formation as was attained in the course of industrial development: this is

[7] Prokopovich's data on Prussia, from the source cited in footnote 1, indicate a substantial widening in income inequality in the early period. The share of the lower 90 per cent of the population declines from 73 per cent in 1854 to 65 per cent in 1875; the share of the top 5 per cent rises from 21 to 25 per cent. But I do not know enough about the data for the early years to evaluate the reliability of the finding

suggested by present comparisons between net capital formation rates of 3 to 5 per cent of national product in underdeveloped countries and rates of 10 to 15 per cent in developed countries. If then, at least in the older countries, and perhaps even in the younger ones—prior to initiation of the process of modern development—we begin with low secular levels in the savings proportions, there would be a rise in the early phases to appreciably higher levels. We also know that during recent periods the net capital formation proportion and even the gross, failed to rise and perhaps even declined.

Other trends might be suggested that would possibly trace long swings similar to those for inequality in income structure, rate of growth of population, rate of urbanization and internal migration, and the proportion of savings or capital formation to national product. For example, such swings might be found in the ratio of foreign trade to domestic activities; in the aspects, if we could only measure them properly, of government activity that bear upon market forces (there must have been a phase of increasing freedom of market forces, giving way to greater intervention by government). But the suggestions already made suffice to indicate that the long swing in income inequality must be viewed as part of a wider process of economic growth, and interrelated with similar movements in other elements. The long alternation in the rate of growth of population can be seen partly as a cause, partly as an effect of the long swing in income inequality which was associated with a secular rise in real per capita income levels. The long swing in income inequality is also probably closely associated with the swing in capital formation proportions—in so far as wider inequality makes for higher, and narrower inequality for lower, country-wide savings proportions.

IV. *Comparison of Developed and Underdeveloped Countries*

What is the bearing of the experience of the developed countries upon the economic growth of underdeveloped countries? Let us examine briefly the data on income distribution in the latter, and speculate upon some of the implications.

As might have been expected, such data for underdeveloped countries are scanty. For the present purpose distributions of family income for India in 1949-50, for Ceylon in 1950, and for Puerto Rico in 1948 were used. While the coverage is narrow and the margin of error wide, the data show that income distribution in these underdeveloped countries is somewhat *more* unequal than in the developed countries during the period after the second world war. Thus the shares of the lower 3 quintiles are 28 per cent in India, 30 per cent in Ceylon, and 24 per cent in Puerto Rico—compared with 34 per cent in the United States and 36

per cent in the United Kingdom. The shares of the top quintile are 55 per cent in India, 50 per cent in Ceylon, and 56 per cent in Puerto Rico, compared with 44 per cent in the United States and 45 per cent in the United Kingdom.[8]

This comparison is for income before direct taxes and excluding free benefits from governments. Since the burden and progressivity of direct taxes are much greater in developed countries, and since it is in the latter that substantial volumes of free economic assistance are extended to the lower-income groups, a comparison in terms of income net of direct taxes and including government benefits would only accentuate the wider inequality of income distributions in the underdeveloped countries. Is this difference a reliable reflection of wider inequality also in the distribution of *secular* income levels in underdeveloped countries? Even disregarding the margins of error in the data, the possibility raised earlier in this paper that transient disturbances in income levels may be more conspicuous under conditions of primitive material and economic technology would affect the comparison just made. Since the distributions cited reflect the annual income levels, a greater allowance should perhaps be made for transient disturbances in the distributions for the underdeveloped than in those for the developed countries. Whether such a correction would obliterate the difference is a matter on which I have no relevant evidence.

Another consideration might tend to support this qualification. Underdeveloped countries are characterized by low average levels of income per capita, low enough to raise the question how the populations manage to survive. Let us assume that these countries represent fairly unified population groups, and exclude, for the moment, areas that combine large native populations with small enclaves of nonnative, privileged minorities, *e.g.*, Kenya and Rhodesia, where income inequality, because of the excessively high income shares of the privileged minority, is appreciably wider than even in the underdeveloped countries cited above.[9] On this assumption, one may infer that in countries

[8] For sources of these data see "Regional Economic Trends and Levels of Living," submitted at the Norman Waite Harris Foundation Institute of the University of Chicago in November 1954 (in press in the volume of proceedings). This paper, and an earlier one, "Underdeveloped Countries and the Pre-industrial Phases in the Advanced Countries: An Attempt at Comparison," prepared for the World Population Meetings in Rome held in September 1954 (in press) discuss issues raised in this section.

[9] In one year since the second world war, the non-African group in Southern Rhodesia, which accounted for only 5 per cent of total population, received 57 per cent of total income; in Kenya, the minority of only 2.9 per cent of total population, received 51 per cent of total income; in Northern Rhodesia, the minority of only 1.4 per cent of total population, received 45 per cent of total income. See United Nations, *National Income and Its Distribution in Underdeveloped Countries*, Statistical Paper, Ser. E, no. 3, 1951, Table 12, p. 19.

with low average income, the secular level of income in the lower brackets could not be below a fairly sizable proportion of average income—otherwise, the groups could not survive. This means, to use a purely hypothetical figure, that the secular level of the share of the lowest decile could not fall far short of 6 or 7 per cent, *i.e.*, the lowest decile could not have a per capita income less than six- or seven-tenths of the countrywide average. In more advanced countries, with higher average per capita incomes, even the *secular* share of the lowest bracket could easily be a smaller fraction of the countrywide average, say as small as 2 or 3 per cent for the lowest decile, *i.e.*, from a fifth to a third of the countrywide average—without implying a materially impossible economic position for that group. To be sure, there is in all countries continuous pressure to raise the relative position of the bottom-income groups; but the fact remains that the lower limit of the proportional share in the secular income structure is higher when the real countrywide per capita income is low than when it is high.

If the long-term share of the lower-income groups is larger in the underdeveloped than in the average countries, income inequality in the former should be narrower, not wider as we have found. However, if the lower brackets receive larger shares, and at the same time the very top brackets also receive larger shares—which would mean that the intermediate income classes would not show as great a progression from the bottom—the net effect may well be wider inequality. To illustrate, let us compare the distributions for India and the United States. The first quintile in India receives 8 per cent of total income, more than the 6 per cent share of the first quintile in the United States. But the second quintile in India receives only 9 per cent, the third 11, and the fourth 16; whereas in the United States, the shares of these quintiles are 12, 16, and 22 respectively. This is a rough statistical reflection of a fairly common observation relating to income distributions in underdeveloped compared with developed countries. The former have no "middle" classes: there is a sharp contrast between the preponderant proportion of population whose average income is well below the generally low countrywide average, and a small top group with a very large relative income excess. The developed countries, on the other hand, are characterized by a much more gradual rise from low to high shares, with substantial groups receiving more than the high countrywide income average, and the top groups securing smaller shares than the comparable ordinal groups in underdeveloped countries.

It is, therefore, possible that even the distributions of secular income levels would be more unequal in underdeveloped than in developed countries—not in the sense that the shares of the lower brackets would be lower in the former than in the latter, but in the sense that the shares

of the very top groups would be higher and that those of the groups below the top would all be significantly lower than a low countrywide income average. This is even more likely to be true of the distribution of income net of direct taxes and inclusive of free government benefits. But whether a high probability weight can be attached to this conjecture is a matter for further study.

In the absence of evidence to the contrary, I assume that it is true: that the secular income structure is somewhat more unequal in underdeveloped countries than in the more advanced—particularly in those of Western and Northern Europe and their economically developed descendants in the New World (the United States, Canada, Australia, and New Zealand). This conclusion has a variety of important implications and leads to some pregnant questions, of which only a few can be stated here.

In the first place, the wider inequality in the secular income structure of underdeveloped countries is associated with a much lower level of average income per capita. Two corollaries follow—and they would follow even if the income inequalities were of the same relative range in the two groups of countries. First, the impact is far sharper in the underdeveloped countries, where the failure to reach an already low countrywide average spells much greater material and psychological misery than similar proportional deviations from the average in the richer, more advanced countries. Second, positive savings are obviously possible only at much higher relative income levels in the underdeveloped countries: if in the more advanced countries some savings are possible in the fourth quintile, in the underdeveloped countries savings could be realized only at the very peak of the income pyramid, say by the top 5 or 3 per cent. If so, the concentration of savings and of assets is even more pronounced than in the developed countries; and the effects of such concentration in the past may serve to explain the peculiar characteristics of the secular income structure in underdeveloped countries today.

The second implication is that this unequal income structure presumably coexisted with a low rate of growth of income per capita. The underdeveloped countries today have not always lagged behind the presently developed areas in level of economic performance; indeed, some of the former may have been the economic leaders of the world in the centuries preceding the last two. The countries of Latin America, Africa, and particularly those of Asia, are underdeveloped today because in the last two centuries, and even in recent decades, their rate of economic growth has been far lower than that in the Western World—and low indeed, if any growth there was, on a per capita basis. The underlying shifts in industrial structure, the opportunities for internal

mobility and for economic improvement, were far more limited than in the more rapidly growing countries now in the developed category. There was no hope, within the lifetime of a generation, of a significantly perceptible rise in the level of real income, or even that the next generation might fare much better. It was this hope that served as an important and realistic compensation for the wide inequality in income distribution that characterized the presently developed countries during the earlier phases of their growth.

The third implication follows from the preceding two. It is quite possible that income inequality has not narrowed in the underdeveloped countries within recent decades. There is no empirical evidence to check this conjectural implication, but it is suggested by the absence, in these areas, of the dynamic forces associated with rapid growth that in the developed countries checked the upward trend of the upper-income shares that was due to the cumulative effect of continuous concentration of past savings; and it is also indicated by the failure of the political and social systems of underdeveloped countries to initiate the governmental or political practices that effectively bolster the weak positions of the lower-income classes. Indeed, there is a possibility that inequality in the secular income structure of underdeveloped countries may have widened in recent decades—the only qualification being that where there has been a recent shift from colonial to independent status, a privileged, *nonnative* minority may have been eliminated. But the implication, in terms of the income distribution among the *native* population proper, still remains plausible.

The somber picture just presented may be an oversimplified one. But I believe that it is sufficiently realistic to lend weight to the questions it poses—questions as to the bearing of the recent levels and trends in income inequality, and the factors that determine them, upon the future prospect of underdeveloped countries within the orbit of the free world.

The questions are difficult, but they must be faced unless we are willing completely to disregard past experience or to extrapolate mechanically oversimplified impressions of past development. The first question is: Is the pattern of the older developed countries likely to be repeated in the sense that in the early phases of industrialization in the underdeveloped countries income inequalities will tend to widen before the leveling forces become strong enough first to stabilize and then reduce income inequalities? While the future cannot be an exact repetition of the past, there are already certain elements in the present conditions of underdeveloped societies, *e.g.*, "swarming" of population due to sharp cuts in death rates unaccompanied by declines in birth rates—that threaten to widen inequality by depressing the relative position of lower-income groups even further. Furthermore, if and when industrialization

begins, the dislocating effects on these societies, in which there is often an old hardened crust of economic and social institutions, are likely to to be quite sharp—so sharp as to destroy the positions of some of the lower groups more rapidly than opportunities elsewhere in the economy may be created for them.

The next question follows from an affirmative answer to the first. Can the political framework of the underdeveloped societies withstand the strain which further widening of income inequality is likely to generate? This query is pertinent if it is realized that the real per capita income level of many underdeveloped societies today is lower than the per capita income level of the presently developed societies before *their* initial phases of industrialization. And yet the stresses of the dislocations incident to early phases of industrialization in the developed countries were sufficiently acute to strain the political and social fabric of society, force major political reforms, and sometimes result in civil war.

The answer to the second question may be negative, even granted that industrialization may be accompanied by a rise in real per capita product. If, for many groups in society, the rise is even partly offset by a decline in their proportional share in total product; if, consequently, it is accompanied by widening of income inequality, the resulting pressures and conflicts may necessitate drastic changes in social and political organization. This gives rise to the next and crucial question: How can either the institutional and political framework of the underdeveloped societies or the processes of economic growth and industrialization be modified to favor a sustained rise to higher levels of economic performance and yet avoid the fatally simple remedy of an authoritarian regime that would use the population as cannon-fodder in the fight for economic achievement? How to minimize the cost of transition and avoid paying the heavy price—in internal tensions, in long-run inefficiency in providing means for satisfying wants of human beings as individuals—which the inflation of political power represented by authoritarian regimes requires?

Facing these acute problems, one is cognizant of the dangers of taking an extreme position. One extreme—particularly tempting to us—is to favor repetition of past patterns of the now developed countries, patterns that, under the markedly different conditions of the presently underdeveloped countries, are almost bound to put a strain on the existing social and economic institutions and eventuate in revolutionary explosions and authoritarian regimes. There is danger in simple analogies; in arguing that because an unequal income distribution in Western Europe in the past led to accumulation of savings and financing of basic capital formation, the preservation or accentuation of present income inequalities in the underdeveloped countries is necessary to secure the

same result. Even disregarding the implications for the lower-income groups, we may find that in at least some of these countries today the consumption propensities of upper-income groups are far higher and savings propensities far lower than were those of the more puritanical upper-income groups of the presently developed countries. Because they may have proved favorable in the past, it is dangerous to argue that completely free markets, lack of penalties implicit in progressive taxation, and the like are indispensable for the economic growth of the now underdeveloped countries. Under present conditions the results may be quite the opposite—withdrawal of accumulated assets to relatively "safe" channels, either by flight abroad or into real estate; and the inability of governments to serve as basic agents in the kind of capital formation that is indispensable to economic growth. It is dangerous to argue that, because in the past foreign investment provided capital resources to spark satisfactory economic growth in some of the smaller European countries or in Europe's descendants across the seas, similar effects can be expected today if only the underdeveloped countries can be convinced of the need of a "favorable climate." Yet, it is equally dangerous to take the opposite position and claim that the present problems are entirely new and that we must devise solutions that are the product of imagination unrestrained by knowledge of the past, and therefore full of romantic violence. What we need, and I am afraid it is but a truism, is a clear perception of past trends and of conditions under which they occurred, as well as knowledge of the conditions that characterize the underdeveloped countries today. With this as a beginning, we can then attempt to translate the elements of a properly understood past into the conditions of an adequately understood present.

V. *Concluding Remarks*

In concluding this paper, I am acutely conscious of the meagerness of reliable information presented. The paper is perhaps 5 per cent empirical information and 95 per cent speculation, some of it possibly tainted by wishful thinking. The excuse for building an elaborate structure on such a shaky foundation is a deep interest in the subject and a wish to share it with members of the Association. The formal and no less genuine excuse is that the subject is central to much of economic analysis and thinking; that our knowledge of it is inadequate; that a more cogent view of the whole field may help channel our interests and work in intellectually profitable directions; that speculation is an effective way of presenting a broad view of the field; and that so long as it is recognized as a collection of hunches calling for further investigation rather than a set of fully tested conclusions, little harm and much good may result.

Let me add two final comments. The first bears upon the importance of additional knowledge and a better view of the secular structure of personal income distribution. Since this distribution is a focal point at which the functioning of the economic system impinges upon the human beings who are the living members of society and for whom and through whom the society operates, it is an important datum for understanding the reactions and behavior patterns of human beings as producers, consumers, and savers. It follows that better knowledge and comprehension of the subject are indispensable, not only in and of itself but also as a step in learning more about the functioning of society—in both the long and short run. Without better knowledge of the trends in secular income structure and of the factors that determine them, our understanding of the whole process of economic growth is limited; and any insight we may derive from observing changes in countrywide aggregates over time will be defective if these changes are not translated into movements of shares of the various income groups.

But more than that, such knowledge will contribute to a better evaluation of past and present theorizing on the subject of economic growth. It was pointed out in the opening lines of this paper that the field is distinguished by looseness of concepts, extreme scarcity of relevant data, and, particularly, pressures of strongly held opinions. The distribution of national product among the various groups is a subject of acute interest to many and is discussed at length in any half-articulate society. When empirical data are scanty, as they are in this field, the natural tendency in such discussion is to generalize from what little experience is available—most often the short stretch of historical experience within the horizon of the interested scholar, which is brought to bear upon the particular policy problems in the forefront. It has repeatedly been observed that the grand dynamic economics of the classical school of the late 18th and early 19th centuries was a generalization, the main empirical contents of which were the observed developments during half to three quarters of a century in England, the mother country of that school; and that it bore many of the limitations which the brevity and exceptional character of that period and that place naturally imposed upon the theoretical structure. It is also possible that much of Marxian economics may be an overgeneralization of imperfectly understood trends in England during the first half of the 19th century when income inequality may have widened; and that extrapolations of these trends (*e.g.*, increasing misery of the working classes, polarization of society, etc.) proved wrong because due regard was not given to the possible effects upon the economic and social structure of technological changes, extension of the economic system to much of the then unoccupied world, and the very structure of human wants. Wider empirical foundations,

observation of a greater variety of historical experience, and a recognition that any body of generalizations tends to reflect some limited stretch of historical experience must force us to evaluate any theory—past or present—in terms of its empirical contents and the consequent limits of its applicability—a precept which naturally should also be applied to the oversimplified generalizations contained in the present paper.

My final comment relates to the directions in which further exploration of the subject is likely to lead us. Even in this simple initial sketch, findings in the field of demography were used and references to political aspects of social life were made. Uncomfortable as are such ventures into unfamiliar and perhaps treacherous fields, they can not and should not be avoided. If we are to deal adequately with processes of economic growth, processes of long-term change in which the very technological, demographic, and social frameworks are also changing—and in ways that decidedly affect the operation of economic forces proper—it is inevitable that we venture into fields beyond those recognized in recent decades as the province of economics proper. For the study of the economic growth of nations, it is imperative that we become more familiar with findings in those related social disciplines that can help us understand population growth patterns, the nature and forces in technological change, the factors that determine the characteristics and trends in political institutions, and generally patterns of behavior of human beings—partly as a biological species, partly as social animals. Effective work in this field necessarily calls for a shift from market economics to political and social economy.

THE CELLOPHANE CASE AND THE NEW COMPETITION

By GEORGE W. STOCKING AND WILLARD F. MUELLER*

On December 13, 1947 the Department of Justice instituted civil proceedings against E. I. du Pont de Nemours & Company, charging du Pont with having monopolized, attempted to monopolize, and conspired to monopolize the manufacture and sale of cellophane and cellulose caps and bands in the United States in violation of section 2 of the Sherman Act. Almost precisely six years later Paul Leahy, Chief Judge of the United States District Court for the District of Delaware, rendered a decision in the matter.[1] He pointed out that the charge against du Pont of having monopolized cellophane involved two questions: "1. does du Pont possess monopoly powers; and 2., if so has it achieved such powers by 'monopolizing' within the meaning of the Act and under *United States* v. *Aluminum Company of America* [?]" He concluded that "unless the first is decided against defendant, the second is not reached."[2] Judge Leahy did not need to reach the second question for he found the defendant not guilty. In doing so he concluded that "[f]acts, in large part uncontested, demonstrate du Pont cellophane is sold under such intense competitive conditions acquistion of market control or monopoly power is a practical impossibility."[3] In reaching this conclusion Judge Leahy reviewed at length evidence introduced by the defendant to show that du Pont behaved like a competitor, not like a monopolist. The court found that du Pont conducted research to improve manufacturing efficiency, to reduce cost of production, and to improve the quality and develop new types of cellophane. It promoted the development and use of packaging machinery that could handle both cellophane and other flexible wrapping materials. In doing so it not only helped to increase cellophane sales but stimulated improvement

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[1] *United States* v. *E I du Pont de Nemours & Co.*, 118 F. Supp 41 (D. Del. 1953). This study is based largely on the testimony and exhibits in this case, but it does not consider cellulose caps and bands. Du Pont discontinued making caps before the government filed its complaint, and the district court, as with cellophane, found no monopolizing of bands. The Supreme Court has indicated that it will review this decision. References to the government's exhibits will be designated as GX, to the defendant's exhibits as DX, and to the transcript of testimony as T.

[2] 118 F. Supp. at 54.

[3] *Ibid.*, pp. 197-98.

in rival flexible wrapping materials. It supplied customers with technical services to help them solve problems created by the use of cellophane. It developed over fifty types of cellophane tailored to meet the special wrapping needs of particular products. It studied the buying habits of the public. It conducted market studies to determine the effect on sales of packaging a product in cellophane. It promoted sales by educating potential cellophane users to the sales appeal of a transparent wrapping material. It reduced prices to get into new and broader markets. The court found that in response to price and quality changes buyers at times shifted from cellophane to competing products and back again. The court concluded that "[t]he record reflects not the dead hand of monopoly but rapidly declining prices, expanding production, intense competition stimulated by creative research, the development of new products and uses and other benefits of a free economy."[4]

This conclusion, based as it is on 7500 pages of testimony and 7000 exhibits, cannot easily be dismissed. Many economists relying on the logic of the "new competition" will find in it support for their theories. One has already pronounced Judge Leahy's opinion as a victory for our profession.

Such an optimistic conclusion so lightly reached by an economist and such high praise so extravagantly given by a judge warrant, first, a brief statement of the criteria by which economists can determine the existence of monopoly and, second, an application of the relevant criteria to du Pont's cellophane operations in an effort to answer the question, has du Pont had monopoly power in making and selling cellophane?

Detecting monopoly is simpler than measuring it.[5] While economists recognize that few if any industrial markets are free entirely from the influence of monopoly, by studying the structure and behavior of markets they can generally isolate characteristics which taken together will permit them to classify markets as effectively competitive or noncompetitive. In trying to classify du Pont's market for cellophane, we shall rely primarily on three criteria: (1) What role has business strategy played in du Pont's production and sales policies? (2) Is cellophane sufficiently differentiated from rival products to have a distinct market, or is its market that of all flexible wrapping materials? (3) Do the trend and level of its earnings reflect monopoly power or competition?[6]

[4] *Ibid*., p. 233.

[5] Fritz Machlup is probably correct in concluding that "so many different elements enter into what is called a monopolistic position and so complex are their combined effects that a measurement of 'the' degree of monopoly is even conceptually impossible." *The Political Economy of Monopoly* (Baltimore, 1952), p. 527.

[6] Clair Wilcox uses the following criteria in classifying markets in his TNEC study,

I. *Business Strategy as Evidence of Monopoly*

Economists have said a good deal about the role which strategy plays among oligopolists jockeying for market position. They have said less about the significance of business strategy as a basis for classifying an industry as monopolistic or workably competitive. We believe it is an important criterion. Purely competitive markets do not generally confront buyers and sellers in the business world. Frequently sellers are few, products are differentiated, knowledge is imperfect, obstacles to the movement of factors exist. Business firms from time to time make deliberate adjustments in both their price and production policies; they resort to strategy to improve their lot. Strategy may be directed to other than price and production policies. Business executives are constantly alert for any business advantage that will make their market position more secure or isolate them from the impact of competitive forces. They seek control of the sources of the best raw materials and the richest natural resources. They try to improve their products and processes or to discover and develop new and better ones. They try to protect their accumulated know-how as business secrets or, where they can, to obtain patents that legalize monopoly.

Economists recognize these practices as manifestations of business rivalry, as aspects of the sort of competition that characterizes modern industrial markets. Business rivalry is itself a symptom of the absence of pure competition. Farmers who, lacking government aid, sell in competitive markets do not regard each other as business rivals but as neighbors. But even when businessmen forego active price competition, they generally do not abandon all rivalry. Correctly, economists have concluded that this rivalry may protect the public interest. It leads to technological innovation and to economic progress. Although economists recognize that business strategy may lead to monopoly, some economists believe that in a dynamic capitalistic society monopoly is inevitably short-lived. It is continually being undermined by the rivalry of other

Competition and Monopoly in American Industry (1940) (1) the number of producers and the extent of industrial concentration, (2) uniformity of price quotations, (3) degree of price flexibility, (4) volume of production and extent of utilization of capacity, (5) rate of profit, and (6) rate of business mortality. Alone no one of these is a satisfactory index, and together they may be misleading unless perchance there is a consistency among the several indexes. We place considerable emphasis on two factors not included in Wilcox's list, business strategy and product differentiation, and we consider only incidentally if at all most of the factors on which Wilcox relied. Applying Wilcox's criteria to our conception of the cellophane market, we find that producers are few, concentration is high, profits are high, turnover of producing units is low, business mortality is low. These criteria suggest monopoly power. On the other hand, cellophane prices have been flexible and surplus capacity has been negligible. These characteristics suggest competition. Whether or not the factors we have chosen are adequate to answer the question we have raised we leave to the reader.

firms. The better product, the better process of today gives way to the better product, the better process of tomorrow. Only the imperfections and mortality of monopoly make it tolerable. Businessmen striving for monopoly promote the public welfare by failing to achieve their goal. Where they achieve it, either by independent business strategy or by collusive action, the public interest may not be served.

With these principles in mind, let us examine du Pont's strategy in developing the cellophane business in the United States. In doing this we do not mean to suggest that its strategy was immoral or unlawful. As Knauth has so well said:

> The contracts and arrangements which businessmen make from day to day seem to them wise, prudent, sound, and inherent in the nature of modern business. When their practices receive legislative interpretation and are denounced as monopolistic, they are puzzled. What has hitherto been deemed eminently proper and ethical now subjects them to unexpected criticism and opprobrium.[7]

No opprobrium is intended in this analysis.

Du Pont became acquainted with cellophane through its production of artificial silk. In 1920 it had entered into a contract with the Comptoir des Textiles Artificiels, a French corporation, which through its affiliates was then an important manufacturer of rayon in France, Switzerland, Belgium, and Italy, for the joint operation of an American rayon company using the viscose process. The viscose solution for making rayon was practically identical with that used in making cellophane.[8] The Comptoir had made about 970,000 pounds of cellophane in 1922, nearly 40 per cent of which it sold in the American market as a transparent wrapping material. Aware of the affinity of rayon and cellophane processes and impressed by the prospects of large cellophane sales in the American market, du Pont in 1923 signed an option contract with Arena Trading Corporation,[9] a Delaware corporation which was acting for itself and its associates, including La Cellophane, Société Anonyme, the Comptoir's affiliate which made cellophane. Under the option Arena provided du Pont with all relevant economic and technical information to enable it to decide within four months whether it wished to make and sell cellophane in North and Central America through a corporation jointly owned by it and La Cellophane. If du Pont decided affirmatively, Arena agreed to transfer to the new corporation its technical knowledge, patent rights, trade marks, and good will and the ex-

[7] Oswald Knauth, *Managerial Enterprise* (New York, 1948), p. 11.

[8] Report of Dr. Fin Sparre, head of du Pont's development department, April 14, 1923, GX 392, pp. 5431-32.

[9] Agreement of January 6, 1923, GX 1458, pp. 5999-6009.

clusive right to make and sell cellophane in the North and Central American markets. This arrangement apparently contemplated the new corporation's becoming the sole producer of cellophane in these markets. At that time only the French Comptoir through its affiliates made cellophane any place in the world.

On June 9, 1923 du Pont entered into an organizational agreement providing for the transfer to the new company, Du Pont Cellophane Company, Inc., of "an unqualified, unrestricted and exclusive right to use all and every process now owned" by Arena "or which may hereafter be acquired by it . . . in connection with the manufacture of cellophane . . ."[10]

Before entering into this agreement du Pont had made an intensive study of the market possibilities of cellophane and of its production problems and decided that Arena could not deliver all the protection from competition that it had promised. About the patents du Pont's development department had said: "[T]he patent protection at present is exceedingly inadequate not to say worthless, and the future patent protection is problematical because it is based on applications for patents, the issuance of which may not be determined for a matter of two years or more."[11] The development department had concluded that it was "by no means certain that the American Cellophane Company could *maintain* a monopoly on the strength of either present or prospective patents."[12] Du Pont accordingly insisted on a provision in the organizational agreement that should the patent protection prove inadequate, Arena was to forfeit ten thousand shares of common stock in the new company.[13]

Du Pont apparently recognized that La Cellophane's trade secrets promised a protection from competition that the patents did not, and that as the first domestic producer of a differentiated if not unique product[14] it could for some time at any rate anticipate monopoly revenue in making and selling cellophane. It calculated that with an investment of $2,000,000, at current domestic prices for imported cellophane it

[10] GX 1001, p. 992. The agreement specifically excluded processes which might subsequently be acquired by Arena from third parties, but it gave du Pont an option to purchase such rights for the North and Central American markets. Although Arena did not guarantee the validity of the patents to be licensed (*ibid.*, p. 989), it specifically promised to give the new company "the exclusive right to manufacture cellophane in North and Central America to be used for any purpose whatsoever." *Ibid.*, p. 993. Arena and Du Pont Cellophane signed their license agreement December 26, 1923. GX 1002, pp. 998-1001.

[11] GX 392, p. 5433.

[12] *Ibid.*, p. 5434. Emphasis supplied.

[13] GX 1001, pp. 989-90.

[14] Du Pont's development department concluded that glassine, sheet gelatin, and tin foil, cellophane's closest rival products, offered no serious competition because of price or quality differences. GX 392, pp. 5437-38.

could earn $631,832, an annual rate of 31.6 per cent.[15] This it regarded as sufficiently attractive to justify the venture.

Du Pont the Sole Domestic Producer

Du Pont became the sole domestic producer of cellophane and thereby a monopolist in its sale. The Department of Justice contended that it was an unlawful monopoly from the outset,[16] but the district court decided otherwise. Whether lawful or not, du Pont was a monopolist in producing cellophane, and it anticipated and in fact earned monopoly profits from the outset.

This is a characteristic of any successful innovation. As Knight has pointed out,

> There is . . . no clear distinction in practice between profit and monopoly gain. . . . New products . . . must also yield enough temporary monopoly revenue to make such activities attractive.[17]

But as Knight has also pointed out, we must distinquish between justifiable monopoly revenue—returns to the innovator—and what Knight calls monopoly gains. Monopoly gains according to Knight are monopoly revenues that are "too large or last too long." What is too long or too large Knight does not say, but he clearly implies that the procedure by which they are made large and perpetuated may convert justifiable monopoly revenue into socially unjustifiable monopoly gains.

Having achieved at the outset a monopoly in producing and selling cellophane in the American market, du Pont took steps to protect its position.

One of its first strategic moves was to obtain an increase in the tariff. This became urgent in 1925, when Société Industrielle de la Cellulose (SIDAC) completed a cellophane plant in Belgium and began exporting cellophane to the American market at cut-rate prices. Du Pont first considered a patent infringement suit against Birn & Wachenheim, SIDAC's American distributors, but fearful that it would lose such a suit decided against it and in favor of a try for higher duties.[18] Its first step

[15] *Ibid.*, p. 5451

[16] Brief for the United States of America, pp. 150-56, *United States v. E. I. du Pont de Nemours & Co.*, 118 F. Supp. 41 (D. Del. 1953).

[17] F. H. Knight, "An Appraisal of Economic Change—Discussion," Proceedings of the American Economic Association, *Am. Econ. Rev.*, May 1954, XLIV, 65.

[18] About the suit Dr. Sparre of du Pont wrote W. C. Spruance, du Pont vice president, on August 3, 1925: "My belief is that it would cost a whole lot of money and that we would lose in the end, that is if the other side would be willing to fight." GX 1069, p. 1153. About du Pont's effort to get higher duties on cellophane, L. A. Yerkes, president of Du Pont Cellophane, had written Spruance on July 25. "In order that you shall be entirely familiar with the Cellophane status, I want to let you know that we are endeavoring to have the duty on Cellophane raised from 25% to 45%, and Curie, Lane

in getting the tariff raised was to request the United States Commissioner of Customs to reclassify cellophane as a "cellulose compound" instead of as a "gelatin compound." When the Commissioner refused, du Pont appealed to the United States Customs Court. Its appeal was successful; the court ordered a reclassification and on February 24, 1929 the duty increased from 25 to 60 per cent ad valorem.[19] Apparently this was enough to prevent price cutting by importers. At any rate du Pont's quarterly competitive report for the second quarter of 1929 stated:

> The present tariff rate (.40 per pound) as fixed by the United States Customs Court, has increased the cost of importing Transparent Cellulose Sheeting to such an extent that the competitors are adhering more rigidly to their published price list. Their selling policy in the past has been to obtain preference with the manufacturer by offering special price concessions.[20]

Du Pont won the field so completely from imported cellophane that its cellophane sales for 1929 represented 91.6 per cent of the total business in the United States,[21] whereas importers had had 21 per cent in 1927 and 24 per cent in 1928.[22] The Tariff Act of 1930 fixed the duty on imported cellophane at 45 per cent ad valorem,[23] and cellophane imports were never again significant. In no year between 1930 and 1947 did they amount to 1 per cent of cellophane consumption in the United States.[24]

Division of World Markets

La Cellophane's plan to develop the American market through a single company jointly owned by it and a domestic firm was not unique. Before transferring to Du Pont Cellophane Company, Inc., its rights to the American market, La Cellophane had made a similar agreement

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and Wallace are of the opinion that we have a fair chance of getting this through." GX 1068, p. 1142.

[19] The district court appropriately characterized du Pont's protest against what du Pont regarded as an improper classification of cellophane as "the normal act of a business concern engaged in active competition with importers of foreign products." 118 F. Supp. at 167. The court also recognized that the tariff readjustment eventually shut out foreign competition. *Ibid.*, p. 221.

[20] GX 432, p. 5690.

[21] Du Pont Cellophane's quarterly conpetitive report, fourth quarter 1929, GX 434, p. 5714.

[22] *Ibid.*, first quarter 1929, GX 431, p. 5677.

[23] 19 U.S.C.A. sec. 1001, par. 31(c). In 1951 the tariff was reduced to 22½ per cent ad valorem. *United States* v. *E. I. du Pont de Nemours & Co*, 118 F. Supp. 41, 167 (D. Del. 1953).

[24] GX 182A, p. 515A; GX 182, p. 515.

with Kalle & Company (hereinafter Kalle) covering the German market. Ultimately Kalle obtained exclusive rights to La Cellophane's process and patents for the manufacture and sale of cellophane in Germany, Austria, Hungary, Czechoslovakia, Yugoslavia, Poland, Russia, Romania, China, Denmark, Sweden, Norway, and Finland.[25]

Although La Cellophane had agreed to furnish du Pont with such technological information and patent rights as it might later acquire from its other licensees, du Pont sought to fortify its market position through a direct agreement with Kalle.[26] On May 7, 1929 both parties agreed to exchange free of charge except for patent fees all patent rights and technical data covering cellophane that they then had or might later get.[27] This agreement did not specifically recognize a division of markets, but on October 30, 1929, C. M. Albright, Du Pont Cellophane vice president, listed for the Buffalo office the countries to which Kalle had exclusive rights. About the agreement Albright wrote: "The agreement, for obvious reasons, does not include the territorial limits, and it is suggested that this letter be attached to the copy of agreement for our future guidance."[28] By the summer of 1930 du Pont had patents on its moistureproof cellophane in the United States and possessions, Belgium, France, and Italy and had applications pending in Great Britain, Canada, Japan, the European countries in Kalle's exclusive territory, and eight South American countries.[29] Du Pont assigned its moistureproof patent rights in the countries in Kalle's territory to Kalle or gave it implied licenses under which Kalle took out patents in its own name.[30]

[25] Letter of October 30, 1929 from C. M. Albright, Du Pont Cellophane vice president, to the Buffalo office, GX 1091, p. 1195.

[26] As early as September 1925, J. E. Crane, du Pont's European manager, had written H. G. Haskell, du Pont vice president, of talks with Dr Duttenhofer of Kalle & Company on the desirability of cooperation between du Pont and Kalle. Crane wrote: "Dr Duttenhofer stated that as we were to cooperate in other matters it would be a pity to compete in artificial silk and cellophane." GX 1393, p. 1800.

[27] GX 1087, pp. 1183-86. Perhaps another reason for du Pont's wishing to deal directly with Kalle is that on April 1, 1929 Du Pont Cellophane became du Pont's wholly owned subsidiary by an exchange of stock. Du Pont organized a new corporation, also named Du Pont Cellophane Co., Inc., La Cellophane to sit on its board as long as du Pont considered this in the new company's best interest. The 1923 agreements remained in force. Agreement of March 18, 1929 between du Pont and La Cellophane, GX 1003, p. 1005. On July 1, 1936, du Pont dissolved Du Pont Cellophane Co., Inc., and replaced it with a cellophane division in its rayon department. Memorandum dated February 17, 1944, on the history of du Pont cellophane, prepared in du Pont's cellophane division, GX 1, p. 8.

[28] GX 1091, p. 1195.

[29] Memorandum dated August 26, 1930, from Du Pont Cellophane's cellophane department to W. S. Carpenter, Jr., chairman of its board of directors, GX 2469, p. 3164.

[30] Du Pont Cellophane memorandum dated March 17, 1933, GX 1098, p. 1205; letter to Kalle dated March 20, 1933, GX 1099, p. 1206; memorandum dated April 27, 1934,

Five years later du Pont entered a technical exchange and license agreement with British Cellophane Limited (hereinafter BCL), a La Cellophane licensee, which specifically delineated the territories within which each party would operate.[31] Under this agreement du Pont was to assign its British patents on moistureproof cellophane to BCL. Du Pont also assigned its French patents on moistureproof cellophane to La Cellophane[32] and its Canadian patents to Canadian Industries Limited.[33]

Meanwhile all the world's leading cellophane producers except du Pont had tried to establish an international cartel to assign territories and fix quotas among themselves. Du Pont representatives attended the first day of the cartel conferences in Paris February 11-12, 1930 as "guests and observers" but did not sign the "official report" (agreement).[34] The district court found that they were not authorized to make commitments for du Pont and made none. Nevertheless the agreement recognized the North American market as belonging to du Pont and Sylvania.[35] It did not cover moistureproof or photographic cellophane. SIDAC and La Cellophane agreed to study the possibility of pooling their patents but with the understanding that this would not apply to du Pont patents.[36]

In 1934 du Pont relied on the 1930 cartel agreement in asserting its right to the West Indies as against BCL, to which La Cellophane had granted a license and with which du Pont was then negotiating its technical agreement. In a December 13, 1934 letter to La Cellophane[37] du Pont referred to the minutes of the February 11-12, 1930 meetings of cellophane producers and quoted La Cellophane's letter of April 1, 1932[38] describing the cartel's division of the world and containing the phrases, "Cuba being situated north of the Panama Canal, belonging

Review of the du Pont Kalle Relations, prepared by du Pont's patent service, GX 1102, pp. 1210-12.

[31] Agreement of May 3, 1935, GX 1100, pp. 1229-34.

[32] GX 1102, pp. 1210-12.

[33] Letter dated February 12, 1932, transmitting patent assignments, GX 1187, pp. 1409-26. GX 1114, pp. 1541-44.

[34] Sylvania Industrial Corporation's entry into the American market is described in the following subsection.

[35] The court was not impressed by the "official report" of the cartel agreement. It stated: "Failure to prove any effect from it, this cartel aspect of the case raises a straight issue of fact. Du Pont did not make such an agreement." 118 F. Supp. at 221. Moreover, the court found that the actual conduct of the producers implicated in the agreement was inconsistent with the existence of a cartel. In the court's inimitable language, "Intricate theories of a conspiratorial network is cast aside." *Loc. cit.*

[37] GX 1034, pp. 1064-65.

[38] GX 1022, p. 1044.

thus to your territory." By May 21, 1935 the du Pont-BCL agreement[39] had been signed and du Pont and La Cellophane had agreed that du Pont's territory included the West Indies except the possessions of European powers.[40]

The cartel's course was not an easy one. World depression and the pressure of totalitarian governments for foreign exchange turned members' eyes toward South American markets, and even with agreements and quotas South American prices were unstable. Du Pont's sales there under its 1930 agreement with La Cellophane (discussed in the following subsection) were particularly disturbing to cartel members.[41] On September 6, 1938 La Cellophane wrote du Pont that "it is apparently impossible to bring about a price accord for South America in our Convention."[42] The second world war weakened still further agreements to divide markets. Du Pont's agreements with Kalle and BCL were to run twenty years, subject to renewal, but in 1940 du Pont disavowed all formal territorial limitations, not only with these companies but with Canadian Industries Limited and La Cellophane as well, "in the light of legal developments in this country."[43]

SIDAC Competes with La Cellophane and with du Pont

Although La Cellophane had promised du Pont a monopoly in making and selling cellophane in the United States, it could not fulfill the promise. As du Pont feared, neither its patents nor its know-how was sufficient to protect it from competition. In 1925 two former employees of La Cellophane, using La Cellophane's trade secrets, helped establish

[39] Agreement of May 3, 1935, GX 1109, pp. 1229-34

[40] Memorandum dated May 21, 1935, "to be attached to original contract between E. I. du Pont de Nemours & Co. and Arena Trading Corporation of June 9, 1923," GX 1040, pp. 1075-76.

[41] Du Pont's 1930 agreement with La Cellophane gave du Pont half of whatever rights La Cellophane got in South America and Japan Early in 1932 du Pont wrote La Cellophane that "we have made our prices in South America on plain Cellophane to correspond with yours" (letter dated January 29, 1932, GX 1112, p. 1248), and it tried to find out what quotas for South America La Cellophane and the other producers had agreed on; but it became dissatisfied with the operation of the agreement and on June 2, 1932 informed La Cellophane that henceforth du Pont would "consider ourselves free to pursue our own policy of sales in South America, Japan and China." GX 1023, p. 1045. La Cellophane did not take this declaration of independence too seriously and continued to point out that du Pont sold more than La Cellophane did in South America and Japan. On December 27, 1934 du Pont, although reiterating its stand taken in 1932, expressed willingness to exchange figures on its sales in those markets for La Cellophane's and those "of the other members." GX 1037, p 1070

[42] GX 1445, p. 1920.

[43] Identical letters dated October 17, 1940, GX 1273, p. 1602, GX 1274, p. 1603, GX 1275, p. 1604, GX 1276, p. 1605.

SIDAC, which began to sell in the rich American market.[44] It made its first sales through Birn & Wachenheim, who had handled La Cellophane's business in the United States before the organization of Du Pont Cellophane. In 1929 SIDAC established an American subsidiary, the Sylvania Industrial Corporation of America, and quit exporting cellophane to the United States.[45] By this time it had subsidiaries in England and Italy and competed in La Cellophane's export markets. La Cellophane sued SIDAC for patent infringement and in settlement accepted a stock interest in SIDAC; thus indirectly it became through Sylvania du Pont's competitor in the American market, in violation of its 1923 agreements with du Pont.

Negotiations over this matter were prolonged. Du Pont conceived its problem to be how to "accept reparations and at the same time protect its future position without contravening American statutes."[46] In lieu of reparations La Cellophane lifted the 1923 restriction limiting du Pont to the North and Central American markets. La Cellophane granted it equal rights with itself in Japan and South America.[47] La Cellophane also agreed to keep technical information, patents, and other data which it received from du Pont from going directly or indirectly to SIDAC or Sylvania.

Du Pont Seeks Patent Protection

When du Pont obtained its option to participate jointly with La Cellophane in developing the American market, it had not investigated the validity of La Cellophane's patent claims. The terms of the option had been "predicated on the practical absence of serious competition on the part of other manufacturers either in this country or other countries."[48] Shortly after its organization Du Pont Cellophane launched a research program designed to strengthen its market position by improving cellophane. One of its chief defects was its permeability to moisture. Du Pont promptly attacked this problem and by 1927 had developed a moistureproofing process and had applied for patents. Its basic patent

[44] Memorandum dated February 17, 1944 on the history of du Pont cellophane, prepared in du Pont's cellophane division, GX 1, p 12.

[45] Du Pont Cellophane's quarterly competitive report, third quarter 1929, GX 433, p 5702.

[46] Memorandum of a November 14, 1929 discussion by du Pont officials, GX 1410, p. 1831.

[47] Letter dated March 6, 1930 from du Pont to La Cellophane, GX 1013, pp. 1027-29; excerpt from minutes of May 8, 1930 meeting of du Pont's board of directors, GX 1015, p. 1031.

[48] Report dated April 14, 1923 by Dr. Fin Sparre, director of du Pont's development department, GX 392, p. 5455. See also pp. 5453-56.

covering moistureproof cellophane, Church and Prindle patent No. 1,737,187 issued in 1929, was a product patent broad in scope and extensive in claims.[49] J. E. Hatt, general manager of Du Pont Cellophane's cellophane department, in summarizing du Pont's moistureproof cellophane patent situation in 1930 recognized its vulnerability and indicated that du Pont had taken steps to bulwark it. He described patent applications that du Pont had filed and quoted patent counsel's opinion that they promised "important and substantial additional protection."[50] Between 1930 and 1934 Du Pont Cellophane authorized a research project further to bolster its patent position. In reporting on the success of this project in 1934 President Yerkes said:

> This work was undertaken as a defensive program in connection with protecting broadly by patents the field of moistureproofing agents other than waxes which was the only class of material disclosed in our original Cellophane moistureproofing patents.
>
> The investigations on this subject did, in fact, lead to the discovery of a number of classes of materials which could serve equally well for moistureproofing agents . . . Each of these classes has been made the subject of a patent . . . Altogether, 13 patent applications are being written as a result of the work done under this project, all in view of strengthening our Moistureproof Cellophane patent situation.[51]

These steps proved adequate to forestall other domestic competition[52]

[49] A problem arising during the second world war when the government needed more moistureproof laminated products than du Pont could supply directly, reflects the breadth of the patent claims. Hines of du Pont posed the problem in this way: "What is the best procedure to give the Government these laminated products necessary to win the war and, having decided on that, what can be done to preserve du Pont's position in a postwar economy?" Recognizing that the government's interest might best be served by allowing converters to make them, du Pont feared that the converters might "at the end of the war, be possessed of a great deal of information with respect to the preparation of moistureproofing compositions and the technique of moistureproofing film with them and would be disposed to continue in such a business on a peace-time basis to the detriment of the Company's interests." Memorandum dated January 26, 1942 from du Pont's patent service to du Pont's cellophane research section, GX 2497, pp. 3255-57.

[50] Memorandum of August 26, 1930, GX 2469, p. 3160

[51] December 1933 report to Du Pont Cellophane's board of directors, January 22, 1934, GX 488, p. 6478. Du Pont spent $19,503 on this research project. This compares with an expenditure of only between $5,000 and $10,000 authorized in October 1924 to hire a single chemist to develop the original moistureproofing process. DX 393 and DX 394. Total expenditures for "technical activities expenses," which included all types of technical work designed to improve cellophane production and processes, came to only $32,048 during 1925 and 1926. DX 387.

[52] Du Pont's strong patent position may not have been wholly responsible for the reluctance of other domestic companies to produce cellophane. Apparently Union Carbide & Carbon Corporation in the 1930's considered entering the cellophane field. It purchased rights to a process for making a transparent wrapping material similar to cellophane. Lammot du Pont in a letter of December 2, 1931 to L. A. Yerkes, president of Du Pont Cellophane, stated that in the course of an hour's conversation on this topic with Messrs. Jesse Ricks and Barrett of Union Carbide & Carbon "[t]hey assured me re-

and to bring Sylvania Industrial Corporation to terms when it invaded the American market.

Sylvania Reaches Accord with du Pont

Sylvania completed its Virginia plant for making cellophane in 1930. Apparently its early experimental research to develop a moistureproof cellophane rested, as did du Pont's, on the use of a nitrocellulose base to which gum, wax, and plasticizer were added. When du Pont's Charch and Prindle patent covering moistureproof cellophane was issued, du Pont advised Sylvania informally of its claims and Sylvania after considering them "felt obliged to discard the work they had done up to that time, and approach the subject from a new angle."[53] Their new angle substituted a vinyl resin base for the nitrocellulose base. Du Pont, regarding this as an infringement, advised Dr. Wallach, Sylvania's president, that "we would be obliged to enforce our patent"[54] and eventually filed an infringement suit against Sylvania.[55] In the antitrust proceedings against du Pont the government contended that the "entire infringement suit was nothing more than a harassing action designed to coerce Sylvania into entering a highly restrictive agreement."[56] The district court in finding for du Pont rejected this contention.[57] Since the court has spoken, we do not express judgment on this

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peatedly they did not wish to rush into anything, most of all a competitive situation with du Pont. Their whole tone was most agreeable . . . In the course of the conversation, various efforts at co-operation between Carbide and du Pont were referred to, and in every case assurances of their desire to work together, given." GX 4381, p. 4300.

[53] Memorandum dated February 18, 1931 from J. E. Hatt, Du Pont Cellophane's general manager, to its executive committee, GX 2482, p. 3204.

[54] *Loc. cit.*

[55] The bill of complaint in *Du Pont Cellophane Company* v. *Sylvania Industrial Corporation* appears in the record of the Cellophane case as GX 2479, pp. 3183-90, and Sylvania's answer as GX 2480, pp. 3191-99.

[56] Statement to the court by J. L. Minicus, counsel for the government, T. 2472.

[57] Judge Leahy said: "Neither party dictated the terms of the license agreement by which the suit was settled." 118 F. Supp. at 151. He based this finding on testimony by L. A. Yerkes, president of Du Pont Cellophane. Although Judge Leahy had said that if he found that du Pont did not possess monopoly power it would be unnecessary for him to pass on whether it had monopolized cellophane under section 2 of the Sherman Act and the principles of *United States* v. *Aluminum Co. of America*, 148 F. 2d 416 (2d Cir. 1945), he nevertheless made a decision on that charge also. He ruled that du Pont's licensing and technology exchange agreements with La Cellophane did not unreasonably restrain trade and that their territorial limitations were ancillary to the acquisition of trade secrets. 118 F. Supp. at 219. He ruled that the circumstances under which du Pont acquired its patents failed to show that the "acquisitions affected its ability to exclude competition" (*ibid.*, p. 212), and that du Pont placed only "lawful and reasonable limitations on use" in its licenses (*ibid.*, p. 211). In any event, he ruled, du Pont had a lawful monopoly in its moistureproof cellophane patent. He said: "Evidence does not disclose combining of competing or independent process patents or efforts to control unpatented products" (*ibid.*, p. 214).

issue. But we wish to review briefly evidence that throws some light on du Pont's strategy.

The record indicates that (1) du Pont in negotiating for reparations following SIDAC's entry into the American market considered and rejected a proposal that it grant Sylvania a license which would restrict its output; (2) after warning Sylvania that it would defend its patents and learning that Sylvania challenged their validity, du Pont postponed action while entrenching its patent position;[58] (3) although professing confidence in its ability to establish its patents' validity, du Pont offered to settle the issue by granting a license limiting Sylvania's production of moistureproof cellophane to 10 per cent of the companies' combined output;[59] (4) on Sylvania's rejecting this offer du Pont formally notified Sylvania that it was infringing du Pont's moistureproofing patents and asked that it cease;[60] (5) upon its refusal to desist du Pont formally inaugurated infringement proceedings; and (6) before the proceedings were carried to completion du Pont and Sylvania settled the suit by a patent exchange and licensing agreement.[61]

Both parties no doubt thought that they stood to gain by a settlement. If Sylvania lost the suit, it would be forced to stop producing moistureproof cellophane or to produce it on such terms as du Pont might offer. If it won, anyone with adequate resources could produce cellophane, and selling cellophane would become a competitive enterprise. After a discussion with Sylvania's general counsel du Pont's patent attorney summed up Sylvania's plight as follows:

> During the conference Mr. Menken stated that in his opinion the case should be settled. He said that they were very fearful of what the result would be to their company in the event they succeeded in having the claims of the patents which are involved in the litigation held invalid. He seemed to realize the old adage that the defendant can never win. . . . If the Du Pont Cellophane Company succeeds and the patents are held to be infringed, Sylvania Industrial Corporation will be under injunction and will be obliged to stop manufacturing moistureproof wrapping tissue. On

[58] A running memorandum of developments in the du Pont-Sylvania patent controversy between July 9, 1931 and April 6, 1933, in the du Pont files, contains the following statement: "At Board meeting on 8/21/31 . . . [i]t was felt by Mr. Pritchard [du Pont's patent counsel] that actual suit against Sylvania should not be instituted until we have these claims issued in form of actual patents. . . . L A Y. [Yerkes, Du Pont Cellophane's president] still felt it would be desirable for us to have Sylvania under a license agreement if possible." GX 2478, p. 3181

[59] *Loc. cit.* On August 27, 1931 Yerkes wrote to Dr. Wallach confirming an oral offer made on or about July 9, 1931. A memorandum dated July 13, 1931 outlines the terms of the offer. GX 2483, p. 3206.

[60] GX 2478, p. 3181. The memorandum refers to a letter dated 11/19/31 which lists the patents du Pont claimed to be infringed.

[61] Agreement dated April 26, 1933, GX 2487, pp. 3212-33.

> the other hand, if they succeed in having the broad claims of the patents held invalid they will throw the art open, as far as the broad claims are concerned, to anyone and therefore will have additional competition. Sylvania . . . has plenty of ready cash but are hesitant about enlarging their plant facilities pending the litigation since, if successful, they will only invite further competition.[62]

With neither side ready to test the validity of du Pont's patents, the parties compromised. The compromise constituted no threat to du Pont's dominant market position.

Under the settlement reached April 26, 1933, Du Pont Cellophane granted Sylvania a nonexclusive license (made exclusive in 1938) of du Pont's five basic patents on moistureproof cellophane and agreed to license to it any patents within their scope which du Pont might get before October 16, 1948. Sylvania agreed to grant similar rights to Du Pont Cellophane under any patents which it might get. Sylvania agreed to pay du Pont a royalty of 2 per cent of its net cellophane sales for the use of du Pont's basic patents and an additional 2 per cent if Sylvania accepted licenses under future du Pont patents representing departures from the five basic patents. But the settlement went further than a mere cross-licensing of present and future patents. It provided that Sylvania's production be restricted to a fixed percentage of total moistureproof cellophane sales, beginning with 20 per cent in 1933 and increasing by 1 per cent until it reached 29 per cent in 1942. Should Sylvania exceed its share in a given year, it agreed to pay a penalty royalty of 20 cents a pound or 30 per cent of its net cellophane sales, whichever was higher. If du Pont used any of Sylvania's patents, it agreed to a similar penalty for exceeding its basic quota. But it never used them.

Until June 1951 du Pont and Sylvania were the only producers of cellophane in the American market.[63] Between 1933 and 1945 (when they contracted for smaller royalties and abandoned penalties for exceeding their quotas), with Sylvania's output geared to du Pont's, du Pont could determine how much cellophane should come on the market. Actually the penalty provision of the agreement never operated and its deletion from the 1945 agreement produced no marked effect on Sylvania's production. The court found that "[i]ts policies as to expansion in no way changed following the termination of the 1933 agreement in 1945."[64] Although their shares varied from time to time, du Pont

[62] Letter dated August 4, 1932 from W. S. Pritchard to B. M. May, GX 2811, pp. 6073-74.

[63] In June 1951 Olin Industries, Inc., began the production of cellophane at Pisgah Forest, North Carolina. Testimony of Fred Olsen, Olin vice president, T. 6829.

[64] 118 F. Supp. at 157.

supplied about 76 per cent and Sylvania 24 per cent of the market from 1933 to 1950.[65] But gearing Sylvania's production to du Pont's must have lessened Sylvania's incentive to independent, vigorous rivalry, price or nonprice, and the record indicates that until January 1, 1947 Sylvania's quoted prices were generally identical with du Pont's.[66]

Conclusion

Du Pont's moves and countermoves to protect its domestic market were the strategy of a producer operating in a monopolistic, not a competitive, market. Its agreements with foreign producers to license patents and exchange technical data, its domestic patent program, its effort to get higher tariffs, its restrictive market agreement with Sylvania, all reflect du Pont's effort to preserve what it apparently regarded as a monopoly market. That du Pont and Sylvania (whose production was geared to du Pont's and whose quoted prices were generally identical with du Pont's) together monopolized the market for cellophane seems scarcely debatable. That du Pont acted as though in its monopoly of cellophane it had a valuable property right which it sought to exploit is equally clear. But was du Pont mistaken? Were available substitutes so similar that du Pont's monopoly of cellophane was in reality a mirage or a phantasy? Is there in fact no distinct market for cellophane, but only a larger market for flexible wrapping materials with producers so numerous that none can make monopoly profits? Let us turn to that question.

II. *Cellophane—A Differentiated Product?*

For several years du Pont was the sole domestic producer of cellophane and for a quarter of a century Sylvania and du Pont were the only producers. But buyers of flexible wrapping material need not rely solely on these two suppliers. Several hundred rivals produced flexible

[65] Data on production, 1933 to 1950, table in *United States v. E. I. du Pont de Nemours & Co.*, 118 F. Supp. 41, 116 (D Del. 1953) In the five years following the expiration of the 1933 agreement Sylvania's percentage of total domestic production was only 1 per cent higher than its percentage in the five years preceding the expiration of the agreement. American Viscose Corporation acquired Sylvania in 1946

[66] Du Pont and Sylvania not only quoted identical prices for their most important cellophane types, but their price changes almost always became effective on the same date. GX 549, pp 7128-66. During the postwar period of short supplies and after the government had instituted its suit against du Pont, differences in Sylvania's and du Pont's prices appeared DX 591, p 1128 Judge Leahy was impressed not by the identity of quoted prices but by the fact that Sylvania at times made discounts from its list prices which du Pont did not match. In speaking of du Pont-Sylvania competition he declared that Sylvania "has continued to expand to the full extent of its financial resources" (118 F. Supp. at 212), and that although du Pont was superior in the services rendered to customers, in technology, in price, and in the development of special types of films, competition between the two companies has "flourished" (*loc cit*).

wrapping materials, in many uses substitutes for cellophane. May not these have converted a monopolistic market into one of workable competition? Let us examine briefly the relevant theory and then the facts.

Price Theory and Product Differentiation

Although others have made important contributions to an understanding of the significance of interproduct competition, Chamberlin, the pioneer, offers a good starting point for this discussion. Chamberlin has recognized that "[a]s long as the substitutes are to any degree imperfect, he [the seller] still has a monopoly of his own product and control over its price within the limits imposed upon any monopolist—those of the demand."[67] But Chamberlin also recognized that rival products, where entry is free and differentiation not marked, could eliminate excess profits even in the "monopolized" field. Expressing his findings diagrammatically, he concluded that the sloping demand curve facing the producer of a differentiated product may become tangent to the cost curve somewhere above lowest average cost. Chamberlin regarded this as a "sort of ideal" solution. As he put it, "With fewer establishments, larger scales of production, and lower prices it would always be true that buyers would be willing to pay more than it would cost to give them a greater diversity of product; and conversely, with more producers and smaller scales of production, the higher prices they would pay would be more than such gains were worth."[68]

Chamberlin's conclusion that the entry of producers of substitute products will eliminate monopoly profits is based upon two important assumptions: (1) his uniformity assumption—"both demand and cost curves for all the 'products' are uniform throughout the group";[69] and (2) his symmetry assumption[70]—"any adjustment of price or of 'product' by a single producer spreads its influence over so many of his competitors that the impact felt by any one is negligible and does not lead him to any readjustment of his own situation."[71]

[67] E. H. Chamberlin, *The Theory of Monopolistic Competition*, 5th ed. (Cambridge, Mass., 1947), p. 67.

[68] *Ibid.*, p. 94. This assumes, of course, that buyers know what they get and get what they want in buying a differentiated product. This is a dubious assumption. Years ago a well-known pharmaceutical company by its advertising endeavored to create a widespread fear of halitosis "Not even your best friends will tell you." Having created a fear of halitosis, it provided a product to dissipate it, thereby rendering the buyer a service for which he was willing to pay.

[69] *Ibid.*, p. 82. To simplify his exposition Chamberlin first assumes uniformity in cost and demand curves. Later he abandons this assumption in the interest of reality. In abandoning it he reaches the conclusion indicated in the text: where sufficiently effective substitutes are not offered in the market, monopoly profits result.

[70] G. J. Stigler so describes this assumption. *Five Lectures on Economic Problems* (London, 1949), p. 17.

[71] Chamberlin, *op. cit.*, p. 83.

If cost and demand curves are not uniform, or if the "group" of firms producing the substitute products is sufficiently small to introduce the oligopoly problem, we may expect a divergence from the above solution. As for the uniformity assumption, Chamberlin says: "[I]n so far as substitutes of such a degree of effectiveness may not be produced, the conclusions are different—demand curves will lie to the right of the point of tangency with cost curves, and profits will be correspondingly higher. This is the explanation of *all* monopoly profits, of whatever sort."[72] Thus, unless effective substitutes exist, Chamberlin argues that monopoly profits may be "scattered throughout the group."[73] If Chamberlin's symmetry assumption is not fulfilled, an oligopoly solution may be expected.[74] In either case monopoly profits result.

In applying Chamberlin's theory to the flexible packaging materials market and to cellophane's position in it, the empirical issue revolves about (1) the degree of effectiveness of substitutes, and (2) the number of rival firms. If substitutes are not effective enough to eliminate monopoly profits, it is not necessary to consider the oligopoly problem.

Clark's analysis[75] leads to similar conclusions, viz., that competition among substitutes may eliminate monopoly profits; but Clark goes further than Chamberlin in finding these results salutary. According to Clark the high cross elasticity of demand tends to flatten the monopolist's demand curve. Moreover, the monopolist's fear of potential competition may lead him to behave as though potential competition had become a reality. These two restraining forces, rival substitute products and potential competition, may yield cost-price relationships

[72] *Ibid.*, p. 111. Emphasis in original. This statement of the problem seems to make it similar to if not identical with the conventional, neoclassical conception of monopoly. Richard T. Ely for example pointed out: "The use of substitutes is consistent with monopoly, and we nearly always have them. For almost anything we can think of, there is some sort of a substitute more or less perfect, and the use of substitutes furnishes one of the limits to the power of the monopolist. In the consideration of monopoly we have to ask, what are the substitutes, and how effective are they?" *Monopolies and Trusts* (New York, 1912), pp. 35-36.

[73] Chamberlin, *op. cit.*, p. 113. By the "group" Chamberlin apparently means firms making products which although differentiated are designed for the same use, e.g., toothpaste manufacturers. In his "Monopolistic Competition Revisited," *Economica*, Nov. 1951, N.S. XVIII 352, 353, he abandons the group concept, arguing that "competition is always a matter of substitutes, and . . . substitutes are always a matter of degree." In abandoning the group concept he does not abandon the conclusion that where substitutes are similar enough and entry is free, monopoly profits will disappear and the demand curve will be tangent to the cost curve at some point above minimum cost. But he also recognizes that the "isolated" monopolist, in spite of close substitutes, may find the demand for his own product strong enough to yield him "profits in excess of the minimum."

[74] *Monopolistic Competition*, p. 102.

[75] J. M. Clark, "Toward a Concept of Workable Competition," *Am. Econ. Rev.*, June 1940, XXX, 241-56.

similar to those of pure competition. They may make imperfect competition workable.

An increasing number of economists have come to believe this. Robertson develops the idea somewhat further. In reviewing the significance of interproduct and interindustry competition he concludes that we really need not worry about monopoly for "there is probably not much of it." There is not much of it because the "old-fashioned apparatus of competition works in new ways to save us."[76]

Moreover, this new apparatus of competition once more makes relevant a theory of competition based on large numbers.

> To assess the competitive situation of a firm we must still resort to counting numbers. We cannot do away with the group, for the group exists in the real world. Yet counting only those firms which are within the "industry" tells us very little. We must do our counting by taking categories of uses for the output of an industry, considering what products of other industries directly compete within these categories.[77]

Since a monopolist's product may serve in a great variety of uses, a monopolist may find it "profitable to forego monopoly control in one use in order to push the commodity into many uses."[78] Thus monopoly serves the public by serving itself and in doing so loses its power over the market.

What Robertson has discovered for the economists, businessmen had already professed. David Lilienthal, writing about the "new competition," said:

> I am not saying that active competition between the producers of the same product is of no present consequence. It certainly is. My point is that under present-day conditions it is often the least significant form. The competition between alternative materials, or ways of satisfying human needs and desires, has become a new dimension of competition.[79]

It was on such principles that Judge Leahy relied in reaching his conclusions in the Cellophane case.

This calls for a more careful consideration of the uniqueness of cellophane, of du Pont's pricing policies in selling it, and of the rate of earnings realized in doing so. If cellophane is sufficiently differentiated from other flexible wrapping materials, its demand curve may "lie to the right of the point of tangency with its cost curve" and its producer may receive monopoly profits in making and selling it. If cellophane is

[76] R. M Robertson, "On the Changing Apparatus of Competition," Proceedings of the American Economic Association, *Am. Econ. Rev.*, May 1954, XLIV, 61.

[77] *Ibid.*, pp 53-54

[78] *Ibid.*, p. 57.

[79] D. E. Lilienthal, *Big Business: A New Era* (New York, 1953), p. 60.

a less highly differentiated product within Chamberlin's conception of the term and if entry to the manufacture of rival wrapping materials is not blocked, the maker of cellophane will be faced by a sloping demand curve; but the curve will be tangent to the cost curve at some point above lowest average cost, and the seller will not make a monopoly profit. If the differentiation is so slight and potential competition so imminent as to bring it within Clark's concept of the term, the seller's long-run demand curve will be close to the horizontal (his control over price will be slight) and prices will be close to lowest average cost. If the cellophane market conforms to Robertson's model, cellophane's differentiation will be too slight to count, monopoly profit will not exist, and its price will be competitive. To which of these models does the market for cellophane conform?

The Market for Cellophane

As a first step in answering this question we will examine briefly the flexible packaging materials market. The district court in determining whether du Pont monopolized the market for cellophane concluded that "the relevant market for determining the extent of du Pont's market control is the market for flexible packaging materials."[80] In this broad market the court found several hundred firms selling a variety of differentiated products for an even wider variety of uses. They sold either directly to packagers or to converters who prepared packaging materials for special uses. The court found that in 1949 du Pont cellophane accounted for only 17.9 per cent of the total square yardage of domestic output and imports of flexible packaging materials.[81] (Apparently this did not include kraft paper.) Such a small percentage scarcely demonstrates that du Pont had monopolized the *flexible packaging materials* market. Nor had it. But in passing judgment on the validity of the court's view that there is a single market for flexible packaging materials it may be helpful to classify the major contemporary materials according to their special qualities and major uses.

Cellophane is a thin, transparent, nonfibrous film of regenerated cellulose. It comes in two major types: plain and moistureproof. Moistureproof cellophane far outsells plain. In 1950 plain cellophane sales totalled $12,005,737; moistureproof cellophane sales, $116,660,209.[82] Because moistureproof cellophane sales are over nine times those of plain, our analysis will give primary consideration to moistureproof. Moistureproof cellophane is highly transparent, tears readily but has

[80] 118 F. Supp. at 60.

[81] *Ibid.*, p. 111.

[82] Table showing comparison of du Pont and Sylvania plain and moistureproof cellophane sales, 1924-1950, 118 F. Supp. at 123.

high bursting strength, is highly impervious to moisture and gases, and is resistant to grease and oils. Heat sealable, printable, and adapted to use on wrapping machines, it makes an excellent packaging material for both display and protection of commodities.

Other flexible wrapping materials fall into four major categories: (1) opaque nonmoistureproof wrapping *paper* designed primarily for convenience and protection in handling packages; (2) moistureproof *films* of varying degrees of transparency designed primarily either to protect, or to display and protect, the products they encompass; (3) nonmoistureproof transparent *films* designed primarily to display and to some extent protect, but which obviously do a poor protecting job where exclusion or retention of moisture is important; and (4) moistureproof *materials* other than films of varying degrees of transparency (foils and paper products) designed to protect and display.

Kraft paper is the leading opaque nonmoistureproof wrapping paper. For general wrapping it has no equal. It is cheap, strong, and pliable and gives adequate protection. On a tonnage basis it easily tops all other packaging materials in total sales. But it is neither designed for nor adapted to the special uses for which cellophane was created and, as one market expert has put it, "in the true sense" does not compete with cellophane. More accurately, we think, cellophane does not compete with it. On a cost basis it cannot compete. At less than one cent per thousand square inches, kraft paper sells for less than cellophane's manufacturing cost.

The leading moistureproof *films* which might compete with cellophane include polyethylene, Saran, and Pliofilm. These are relatively latecomers in the packaging field. In some qualities they match or even excel cellophane. But we have it on the authority of du Pont market analysts that these films have offered little or no competition to cellophane in its major markets. According to du Pont's 1948 market analysis, prepared by its experts for company use in making decisions, although Saran was "superior in moisture protection, no significant commercial uses" had developed for it "due principally to its high price" and "no substantial cost reduction" was in sight.[83] In 1949 a thousand square inches of 100-gauge Saran #517 sold for about 2½ times as much as the same amount of moistureproof cellophane (see Table I). Du Pont experts found polyethylene lacking in transparency, "too limp to operate satisfactorily on wrapping machines, . . . difficult to heat seal, print and glue," with "poor surface slip and high static, and . . . permeable to volatile oils and flavorings."[84] Pliofilm, an older rival first mar-

[83] DX 595, p. 1156.

[84] *Ibid.*, pp. 1155-56. The court said of polyethylene: "Many of these deficiencies could be corrected through research, and were." 118 F. Supp. at 81.

TABLE I.—COMPARISON OF AVERAGE WHOLESALE PRICES OF CELLOPHANE WITH PRICES OF OTHER FLEXIBLE PACKAGING MATERIALS IN 1949

Packaging Material	Price per 1,000 sq. in. (cents)	Per Cent of Cellophane Prices		Price per lb. (cents)	Per Cent of Cellophane Prices	
		Moisture-proof	Plain		Moisture-proof	Plain
Saran 100 gauge #517	6.1	265.2	290.5	99.0	207.1	221.0
Cellulose Acetate .00088″	3.3	143.5	157.1	82.0	171.5	183.0
Polyethylene .002″—18″ flat width	5.4	234.8	257.1	81.0	169.4	180.8
Pliofilm 120 gauge N2	3.8	165.2	181.0	80.8	169.0	180.4
Aluminum Foil .00035″	1.8	78.3	85.7	52.2	109.2	165.2
Moistureproof Cellophane 300 MST-51	2.3	100.0	109.5	47.8	100.0	106.7
Plain Cellophane 300 PT	2.1	91.3	100.0	44.8	93.7	100.0
Vegetable Parchment 27#	1.4	60.9	66.7	22.3	46.7	49.8
Bleached Glassine 25#	1.0	43.4	47.6	17.8	37.2	39.7
Bleached Greaseproof 25#	.9	39.1	42.9	15.8	33.1	35.3
Plain Waxed Sulphite 25# self-sealing	1.1	47.8	52.4	15.2	31.8	33.9
Plain Waxed Sulphite 25# coated opaque	.7	30.4	33.3	11.9	24.9	26.6

Source: Prices per thousand square inches and per pound, *United States* v. *E. I. du Pont de Nemours & Company*, 118 F Supp. 41, 83 (D Del 1953). Robert Heller & Associates, management consultants, conducted the price survey for du Pont on which DX 995, the original source of these data, is based G. W. Bricker, who personally supervised the survey, testified that "each of these materials is a principal standard material of that type." T. 4497. In selecting a particular grade Bricker relied on the advice of the Bureau of Labor Statistics, American Pulp and Paper Association economists, and the individual companies from which he got his data.

keted in the mid-thirties, has a rubber base and is particularly well adapted to packaging foods preserved in liquids, a relatively narrow market. Despite its superiority in this use, its high cost (in 1949 a thousand square inches of 120-gauge Pliofilm N2 sold for about 1⅔ times as much as moistureproof cellophane) made it "an active competitor of Cellophane only in those fringe uses bordering markets that need greater moistureproof protection than Cellophane provides."[36]

[36] DX 595, p. 1153. In 1950 Goodyear developed a type satisfactory for fresh meats. 118 F. Supp. at 81.

In 1939 Pliofilm sales were only 2 per cent of cellophane sales; by 1949 they had increased to only 4.4 per cent.[86]

Cellulose acetate, a nonmoistureproof transparent *film*, is an old cellophane rival. First appearing in 1931, by 1939 its sales were only 3 per cent of cellophane's. Ten years later they were only 3.7 per cent.[87] Its chief quality disadvantage is that it is not moistureproof. It compares in quality with plain cellophane, but its 57 per cent higher price in 1949 placed it at a serious competitive disadvantage.

About these several films du Pont in its 1948 market analysis concluded:

> The principal markets for non-viscose films have been competitive with Cellophane only to a very minor degree up to this time. Some are used very little or not at all in the packaging field—others are employed principally for specialty uses where Cellophane is not well adapted—none have been successfully introduced into any of Cellophane's main markets due to their inherent shortcomings.[88]

On the superiority of cellophane as compared with other films for most of cellophane's uses, the experts apparently agreed. Olin Industries, Inc., later to become the third domestic cellophane producer, after investigation reported: "According to du Pont, Cellophane is considered the only all purpose film, and any product to be *truly competitive* with Cellophane must have the following attributes: (1) low cost, (2) transparency, (3) operate with a high efficiency on mechanical equipment, (4) print well both as to speed and appearance."[89] Olin concluded:

> There are no films currently marketed which are potentially competitive to any substantial degree in Cellophane's major markets when measured by the above attributes necessary for wide usage. Other transparent films will find their place for those low volume uses which can absorb the additional cost of the film and which necessitate certain physical properties not possessed by Cellophane.[90]

Consumer decisions confirmed the judgment of the experts. In 1949

[86] GX 531, p. 7101; GX 81, p. 300; DX 596, p 1173.

[87] Comparison of total du Pont and United States production of cellophane and imports of selected flexible packaging materials, 1925-1949, DX 981, p. 1.

[88] DX 595, p. 1147.

[89] Report on "the evidence in support of entry by Olin Industries into the Cellophane business, based on the purchase of patent license and 'know-how' from du Pont," December 15, 1948, GX 566, p. 7575.

[90] *Loc. cit.*

converters used roughly fourteen times as much cellophane as all other packaging films.[91]

Apparently cellophane has no effective rival in another segment of the flexible packaging material market, the outer wrapping of packaged cigarettes. Clear as plate glass, flexible, easily ripped open, moisture-proof, it displays and protects with such perfection that except when they can't get it cigarette makers use no other overwrap.[92] The court recognized this, noting however that makers of Pliofilm, glassine, and aluminum foil keep trying to break into this market. They have not succeeded.

The court to the contrary notwithstanding, the market in which cellophane meets the "competition" of other wrappers is narrower than the market for all flexible packaging materials. Cellophane dominates the market for cigarette overwraps, it does not compete with kraft paper for general wrapping, and in its more specialized markets the non-viscose films do not compete with cellophane except in fringe uses.

Food Packaging

In 1949, 80 per cent of du Pont's cellophane sales were for packaging food products; here cellophane encounters its most vigorous rivalry, "competing" with vegetable parchment, greaseproof paper, glassine, wax paper, and aluminum foil. Each of these wrapping materials is a differentiated bundle of qualities, competing in a wide variety of uses. Users attach a different importance to the several qualities. Many value transparency highly, a quality in which cellophane is outstanding. Some, however, regard transparency as a disadvantage. All are likely to rate moisture protection as important, but wax paper, aluminum foil, and some types of glassine are about as good as cellophane in this. Food packagers in selecting wrapping material no doubt consider carefully the unique combination of qualities represented by each of these materials. They resell the product they wrap and they are cost-conscious. Presumably they try to select the material that, quality considered, will give the greatest value. In determining values they must consider consumer response to the several materials. In any event, some buyers of packaging materials changed from one kind to another in trying to get their money's worth. Some candy makers and some bread bakers, for example, operating on narrow margins in the mid-'thirties switched from cellophane to a less costly wrapper when

[91] DX 985. This is a market analysis prepared for du Pont by Robert Heller & Associates.

[92] A shortage of cellophane in the mid-'forties forced some cigarette makers to use other materials. Brown and Williamson Tobacco Company once experimented with selling Kools and Raleigh cigarettes in a one-piece foil package 118 F. Supp. at 108.

their other production costs mounted. The court concluded from the evidence that "shifts of business between du Pont cellophane and other flexible packaging materials have been frequent, continuing and contested."[93] In no one of the more important uses for packaging foods did cellophane in 1949 supply as much as 50 per cent of the total quantity (in square inches) of wrapping materials used (see Table II).[94] Only

TABLE II.—COMPARISON BY PERCENTAGES OF TOTAL QUANTITY OF SELECTED FLEXIBLE PACKAGING MATERIALS, CLASSIFIED BY END USES*

Type of Material	Bakery Products	Candy	Snacks	Meat and Poultry	Crackers and Biscuits	Fresh Produce	Frozen Food Excluding Dairy Products
Cellophane	6.8	24.4	31.9	34.9	26.6	47.2	33.6
Foil	.2	32.5	.8	.1	.2	.1	.7
Glassine	4.4	21.4	62.8	2.7	10.0	.1	2.1
Papers	88.6	21.6	4.4	57.5	63.2	45.6	60.3
Films	.0	.1	.1	4.8	.0	7.0	3.3
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0

* Based on 1949 sales (in millions of square inches) of nineteen major converters "representing a substantial segment" of the converting industry, *United States* v. *E. I. du Pont de Nemours & Company*, 118 F Supp. 41, 113 (D.Del. 1953). G. W. Bricker of Robert Heller and Associates, management consultants employed by du Pont, testified that the above data covered two thirds of du Pont's and Sylvania's cellophane. T. 4474

in the packaging of fresh produce did cellophane sales top the list. Its percentage of total sales varied from 6.8 per cent for packaging bakery products to 47.2 per cent for fresh produce. Like du Pont's percentage of total sales of all flexible wrapping materials, these specific figures scarcely demonstrate that du Pont has monopolized the sale of flexible packaging material to food packagers.

Such facts apparently led the court to conclude that du Pont, although selling about 76 per cent of the cellophane and together with Sylvania—whose production was geared to du Pont's—selling all of it, had not monopolized the market for *all* flexible wrapping materials. No one is likely to quarrel with this finding. But in an economic sense

[93] *Ibid.*, p. 91

[94] Table II is based on evidence which the court reproduced in the opinion. In less important uses not included in the court's tabulation cellophane accounted for the following percentages of total quantities of the selected flexible wrapping materials used: dry beverages, 6.4 per cent; breakfast cereals, 12.6 per cent; dry fruits and vegetables, 63.7 per cent; frozen dairy products, 1.1 per cent; flour, meal, and dry baking mixes, .5 per cent; nuts, 77.3 per cent; paste goods, 97.4 per cent; paper products, 38 per cent; and textile products, 62.3 per cent. DX 984.

a firm may have a monopoly of a differentiated product, that is, it may behave like a monopolist and enjoy the fruits of monopoly in selling it, even though it meets the rivalry of substitutes. That is the economic issue here. Is cellophane so highly differentiated that du Pont in selling it can follow an independent pricing policy, that is, is the cross elasticity of demand for cellophane so low that du Pont, while pricing it independently, can enjoy a monopoly profit in its sale? Let us examine this issue.

When du Pont first marketed cellophane, it apparently thought cellophane had unique qualities and it adopted a strategy designed to prevent competition from any other producer, in short, to protect its monopoly.[95] It also priced cellophane from the outset to yield monopoly revenue. Its long-run aim in selling cellophane was apparently that of any monopolist, viz., to maximize revenues. But the maximization of revenues over time even by a monopolist may call for a farsighted and vigorous policy in exploiting a product. Monopolists, although they can restrict output and charge relatively high prices, may not find it profitable to do so. Du Pont argued and the court concluded that the test of monopoly is the power to exclude competition and the power to raise prices. A more logical test is the power to exclude competition and the power to *control* prices. That a monopolist may find it profitable to lower prices, increase sales, and reduce costs, even though the public benefits, does not necessarily mean, as Robertson suggests, that he has relinquished monopoly power. To use monopoly power rationally is not to forego it.

President Yerkes of the Du Pont Cellophane Company, Inc., concluded as early as 1924 that to maximize earnings du Pont should reduce cellophane prices. On this issue he said:

> I am in favor of lowering the price. . . . [I] think it will undoubtedly increase sales and widen distribution. . . . Our price I think is too high based purely on manufacturing cost and too high in comparison with other wrapping papers on the market, and while we cannot approach the price of glassine or other oil papers, if we make a substantial reduction we will in some cases get somewhere near there.[96]

Walter S. Carpenter, Jr., chairman of du Pont's board of directors,

[95] If cellophane had encountered the effective competition of rival wrapping materials, du Pont would have had nothing to gain by impeding entry. That is to say, if cellophane were merely one of many substitutable products among which effective competition prevails, the price of each would be driven down to a competitive (cost-remunerative) level and it should be a matter of indifference to du Pont whether this results from rival products or from new producers of cellophane.

[96] Memorandum of some remarks made at a meeting of the board of directors, Du Pont Cellophane Company, Inc., December 11, 1924, DX 337, p. 643.

expressed a similar idea when he testified in the Cellophane case:

> . . . the purpose of reducing our price and also improving our quality was to broaden our market. . . . As a general philosophy I was always in favor of the reduction of the price as we were able to do so by the reduced costs, and I think that I consistently urged that on the management.[97]

The Yerkes-Carpenter philosophy apparently prevailed. The price of cellophane, which averaged $2.508 a pound in 1924, was reduced in every year until 1936, when it averaged 41.3 cents a pound. With minor interruptions the decline continued until cellophane sold for an average price of 38 cents a pound in 1940. Inflation accompanying the second world war reversed the trend. With few exceptions cellophane prices moved upward until 1950, when they averaged 49 cents a pound.[98] But despite the reductions moistureproof cellophane (300 MST-51, the principal type) sold at from two to seven times the price of 25# bleached glassine and from two to four and a half times the price of 30# waxed paper, its most important rivals.[99]

Du Pont's Independent Pricing Policy

On its face du Pont's pricing policy was consistent with that of a monopolist. Other evidence supports this conclusion. Had cellophane's major rival wrapping materials competed with it effectively (*i.e.*, had the cross elasticity of demand between cellophane and other wrappers been high), the prices of such wrapping materials would have moved concurrently to prevent, as Chamberlin says, "incursions by one seller, through a price cut, upon the markets of others."[100] In fact, however, while du Pont was "broadening its market" by reducing cellophane prices, the prices of other wrappers did not follow a similar pattern. Bleached glassine prices were constant from 1924 until 1933 and again from 1934 to 1938. They rose in 1939 and again in 1940. Waxed paper prices fluctuated between .5 cent and .52 cent per thousand square inches from 1933 through 1939 and in 1940 increased to .62 cent. Vegetable parchment prices declined from 1.3 cents to 1.0 cent per thousand square inches between 1924 and 1928 and thereafter fluctuated between .95 cent and 1.05 cents. Bleached greaseproof prices rose from .45 cent per thousand square inches in 1933 to about .55 cent in

[97] T. 6278-79.

[98] Table of annual average prices from 1924 to 1950, *United States v E I du Pont de Nemours & Co.*, 118 F. Supp. 41, 82 (D. Del. 1953).

[99] Defendant's Brief on the Facts and the Law, Appendix A (graph based on prices per 1,000 sq. in.), *United States v. E. I. du Pont de Nemours & Co*, 118 F. Supp. 41 (D. Del. 1953).

[100] Chamberlin, *Monopolistic Competition*, p. 90.

1940.[101] But du Pont's cellulose acetate film dropped in price from 59.3 cents a pound in 1935 to 53.6 cents in 1940,[102] and aluminum foil prices dropped from 2.45 cents to 1.65 cents per thousand square inches between 1928 and 1940. The prices of these rival products and of cellophane followed the same trend, but cellophane and cellulose acetate film sold for substantially more than aluminum foil; and it seems likely that the cross elasticity of demand between the cellulose films and aluminum foil is even less than between them and the other products compared.

Under inflation wrapping material prices have increased since 1940, but not similarly. Average cellophane prices increased by about 20 per cent between 1940 and 1949, but the prices of most other wrappers increased more rapidly: vegetable parchment, about 40 per cent; bleached glassine, 40 per cent; cellulose acetate, 50 per cent; waxed paper, 75 per cent; and bleached greaseproof, 80 per cent. The only two wrappers to increase less in price than cellophane were Pliofilm, 13 per cent, and aluminum foil, 9 per cent.[103] These price patterns indicate that cellophane continued to decrease in price relative to most other wrapping materials.

The above facts demonstrating cellophane's independence of other wrapping material prices strongly suggest that du Pont was not selling cellophane in an effectively competitive market. Either cellophane's rival products were not close enough substitutes to feel the effect of cellophane price decreases (*i.e.*, the cross elasticity of demand between cellophane and these products was low) or they were already selling at cost and could not prevent cellophane's invasion of their markets. In either event they did not constitute sufficiently close substitutes to insure effective competion.

Although du Pont lowered its cellophane prices from time to time as it re-examined its demand and cost functions, at no time did it compete with its most popular rivals on a price basis. As H. O. Ladd, director of du Pont's trade analysis division, put it:

> The main competitive materials . . . against which Cellophane competes are waxed paper, glassine, greaseproof and vegetable parchment paper, all of which are lower in price than Cellophane. We do not meet this price competition. Rather, we compete with these materials on the basis of establishing the value of our own as a factor in better packaging and cheaper distribution costs and classify as our logical markets those fields

[101] DX 994-A. These price comparisons, like those for 1949 in Table I, rest on data collected for du Pont by Robert Heller & Associates and are based on the prices of one principal standard material of each type named.

[102] GX 490, p. 6507; GX 495, p. 6665.

[103] DX 994-A.

where the properties of Cellophane in relationship to its price can do a better job for the user.[104]

But while du Pont resorted to aggressive selling, emphasizing the superiority of its product and extending its services,[105] the evidence does not indicate that at any time it carried quality competition so far as to equalize average cost and selling price. Price differences no doubt reflected at the margin the customers' evaluation of differences in quality, but the record does not indicate that they reflected differences in cost. If they had, with as many firms as are selling flexible wrapping materials, monopoly profits would have disappeared and the market would have become effectively competitive. Let us turn then to du Pont's earning record.

III. *Has Du Pont Earned Monopoly Profits?*

As du Pont reduced cellophane prices, output and sales expanded rapidly. In 1924 du Pont produced only 361,000 pounds of cellophane and sold $1,307,000 worth. A decade later it produced 39,358,000 pounds and sold $18,818,000 worth. In 1940 when cellophane sold at 38 cents a pound, its all-time low, du Pont produced 81,677,000 pounds and sold $31,049,000 worth.[106] Such increases in output and sales had called for a continuous expansion in investment. In 1925 du Pont's fixed and working capital in producing cellophane was $2,122,00. In 1934 it was $24,008,000 and a decade later $41,133,000 (see Table III).

Du Pont's production and pricing policies paid off. In 1925 it earned, before taxes (operating earnings),[107] $779,000 on its cellophane operat-

[104] GX 589, p 7530.

[105] Du Pont showed great ingenuity and aggression in developing new uses for cellophane and expanding old ones R R. Smith, assistant director of sales of du Pont's film department, testified that in 1934, when white bread regularly sold for 10 cents a loaf and its profit margin was small, he and other salesmen actually created the specialty breads industry—new varieties of bread which could be sold at a price large enough to cover the higher cost of wrapping them in cellophane. T 5704-5 In 1936 Smith studied the sales methods of door-to-door bakery salesmen and du Pont made a sales training film "which had nothing to do with packaging" (T. 5721) but showed the way to higher profits even when using cellophane. "The promotion was extremely successful." T. 5705. In 1951 du Pont had about 45 per cent of the variety bread-wrapping business T. 5721.

[106] See comparisons of du Pont and Sylvania production and sales, 1924-1950, *United States* v. *E. I. du Pont de Nemours & Co.*, 118 F. Supp. at 116, 123 (D. Del. 1953).

[107] Du Pont computes operating earnings for each operating division by deducting all of the expenses directly related to its operations from its sales. Among these expenses are production, selling, administration, and research expenditures conducted within and for the particular division. Du Pont calculates its rate of operating earnings on the basis of its working and fixed investment allocated to its cellophane operations.

Net cellophane earnings are calculated by allowing for federal income taxes, capital stock tax, franchise, state income, and foreign taxes, "B" bonus, and fundamental research by the chemicals department. Federal income and other taxes constituted the great bulk of

ing investment. In 1934 it earned $6,000,000 and in 1940, $12,000,000. Although its annual rate of earnings before taxes declined somewhat from a high of 62.4 per cent in 1928, in only two years between 1923 and 1950 inclusive did the rate fall below 20 per cent (see Table III).

Du Pont's cellophane pricing policy is consistent with the economists' assumption that a rational monopolist aims to maximize profits. This did not always call for a price reduction. In 1947 du Pont earned only 19.1 per cent before taxes and only 11.2 per cent after taxes on its cellophane investment[108]—the postwar low. Raising the average price of cellophane from 41.9 cents a pound in 1947 to 46 cents a pound in 1948 paid off. By May 1948 du Pont's operative earnings had increased to 31 per cent. At that time its division manager announced that "if operative earnings of 31 per cent is [*sic*] considered inadequate, then an upward revision in prices will be necessary to improve the return."[109] He suggested a schedule of prices which would increase operative

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these deductions: 90 per cent as early as 1935 (GX 490, p. 6506) and during the second world war practically all, when the company was paying large excess profits taxes. Consequently, cellophane operating earnings may be thought of as primarily representing earnings on total cellophane investment before taxes, and cellophane net earnings as earnings after taxes.

The problem of empirically determining profit rates is subject to many pitfalls. However, the procedure used by du Pont to determine cellophane earnings is subject to fewer criticisms than are usually encountered in profit estimates. It is true that earnings may be understated somewhat because of expenditures not directly related to cellophane manufacture and sale as noted above. On the other hand, some might argue that actual earnings are overstated in some years and understated in others because operating investment is necessarily based in part on historical rather than replacement costs. This error is reduced by the fact that du Pont has increased its capacity periodically by substantial amounts, so that of its historical costs a substantial portion is always recent history. However, some of the most frequent and important shortcomings of profit estimates are not involved in our calculations; operating investment does not include assets capitalized in expectation of excess profits, nor has overcapacity broadened the investment base. Probably the most convincing argument as to the credibility of these earnings is that du Pont has no reason to delude itself as to what it is earning in making cellophane. The investment base which du Pont uses to calculate its rates of operating and net earnings is its estimate of the actual total investment involved in its cellophane operations. Such an investment base is considerably larger than that used by the Federal Trade Commission in its study, *Rates of Return (after Taxes) for 516 Identical Companies in 25 Selected Manufacturing Industries, 1940, 1947-52* (Washington, D.C., 1954), which uses stockholders' investment as its base. If this base were used in calculating rates of cellophane earnings they would undoubtedly be greater for all years. For example, in 1935, the year before Du Pont Cellophane was consolidated with du Pont, the latter's equity in Du Pont Cellophane was only $9,696,000. GX 490, p. 6504. If this were used as a base upon which to calculate du Pont's rate of earnings in that year, instead of that actually used in Table III, its rate of operating earnings would be about 60 per cent instead of 24.6 per cent.

[108] One reason for the relatively low earnings in 1947 was du Pont's inability to put its new capacity at Clinton, Iowa into production as early as predicted. DX 372.

[109] GX 591, p. 7539.

TABLE III.—DU PONT'S OPERATING INVESTMENT, OPERATING EARNINGS, AND NET EARNINGS ON CELLOPHANE, 1925–1950*

Year	Operating Investment (000)	Operating Earnings (000)	Rate of Operating Earnings (per cent)	Net Earnings (000)	Rate of Net Earnings (per cent)
1924	$ 2,000				
1925	2,122[b]	$ 779[a]	36.7[b]	$ 650[b]	30.6[a]
1926	2,482	1,447	58.3	1,191[c]	48.0
1927	2,464	1,104	44.8	906[d]	36.8
1928	2,559	1,597	62.4	1,318[e]	51.5
1929	5,099[a]	2,845[f]	55.8[f]	2,645[f]	51.9
1930	11,178	4,460[g]	39.9[g]	4,273[g]	38.2
1931	18,163	5,431[h]	29.9[h]	5,196[h]	28.6
1932	21,600	3,888[i]	18 0[i]	3,882[i]	17.9
1933	23,277	4,958[j]	21.3[j]	4,800[j]	20.6
1934	24,008	5,978[l]	24.9[k]	4,325[l]	18.0
1935	24,598	6,051[k]	24.6[k]	4,934[k]	20.1
1936	26,262[m]	7,642[m]	29.1[m]	6,119[a]	23.3[m]
1937	27,284[o]	6,876	25.2[n]	5,293	19.4[n]
1938	30,655[a]	8,430[p]	27.5	6,867	22 4
1939	31,837	11,833	36.8	9,137	28.7
1940	33,737	12,179	36 1	6,882	20.4
1941	40,995	16,234	39 6	6,231	15 2
1942	43,482	11,566[q]	26.6	3,652	8.4
1943	42,449	14,263	33.6	3,821	9.0
1944	41,133	13,903	33.8	3,990	9 7
1945	40,431	13,868	34.3	5,620	13.9
1946	41,495	12,241[r]	29.5	6,929	16.7
1947	53,424	10,204	19 1	5,983	11.2
1948	64,800[s]	17,600[s]	27.2	n.a	n.a
1949	n.a.	n.a.	35.2[t]	n.a.	n.a
1950	67,532	30,592[t]	45.3[t]	13,506	20.0[t]
	Average Rate of Return		34.4		24.2

* For definition of operating investment, operating earnings, and net earnings see footnote 107. Before 1937, investment and earnings figures include cellulose caps and bands, cellulose acetate, and adhesives, for some years. On the whole this inclusion decreases the rate of return figures for cellophane slightly, since some of these items were actually sold at a loss at times. The net effect is insignificant, however, since they represent such a small proportion of total earnings and investment—less than 5 per cent in 1935 GX 490, p 6507

[a] Derived from relevant columns
[b] 1925 1928, GX 483, pp. 6409, 6410
[c] GX 481, p 6375
[d] GX 482, p. 6396
[e] GX 483, p. 6418
[f] GX 484, pp. 6431, 6433
[g] GX 485, pp 6441, 6443
[h] GX 486, pp. 6453, 6455
[i] GX 487, pp. 6464, 6466
[j] GX 488, pp 6479, 6481
[k] GX 490, p. 6503
[l] GX 489, p. 6493
[m] GX 384, p. 969
[n] 1937–1947, GX 591, p. 7539
[o] GX 492, p 6571
[p] 1938-1941, GX 495-A, p. 6716
[q] 1942-1945, GX 499, p. 6839
[r] 1946–1947, GX 501, p 690
[s] GX 577, p. 7323
[t] GX 573 (I), p. 8. Exhibit impounded by court, cited in government's Proposed Findings of Fact, p. 48, and Brief for the United States, pp. 144, 145, *United States* v. *E. I. du Pont de Nemours & Company*, 118 F.Supp. 41 (D.Del. 1953)

Sources: The exhibits referred to are annual profit and loss statements of Du Pont Cellophane Company or the cellophane division of E. I. du Pont de Nemours & Company

earnings to about 40 per cent.[110] This was not put into effect until August 1948. Operative earnings for 1948 averaged only 27.2 per cent; but by 1949 they had increased to 35.2 per cent and by 1950 to 45.3 per cent. Operative earnings after taxes yielded 20 per cent on du Pont's investment in 1950.

Du Pont's pricing policy in the postwar inflation is also consistent with the theory of monopolistic behavior, but the record indicates that profit maximization was not the sole factor affecting price decisions. The division manager in suggesting price increases called attention to other relevant factors:

> 2. What effect, if any, will a price increase have on our case when it is heard before the Federal Judge? I have not covered this with our Legal Department but in view of the position they took last July and August, prior to the October increase, I am inclined to think they should be brought in for a discussion on this matter.
>
> 3. The du Pont Company may get some undesirable publicity from the press. A price increase on Cellophane could be looked upon as added fuel to the present recent spurt in the inflationary spiral and add to the present pressure for an increase in wages. This question is currently a live one at several of our Cellophane plants. Probably it would be in order to discuss this with Mr. Brayman.[111]

After considering these questions du Pont executives decided on the price increase.[112]

Cellophane's earnings record offers persuasive if not convincing evidence that du Pont has had monopoly power in selling cellophane. A comparison of du Pont's earnings from cellophane with its earnings from rayon lends force to this conclusion.[113] Despite the dissimilarity of the end products, several factors justify the comparison. Cellophane and rayon stem from the same basic raw materials. Both are radical innovations. Both were initially manufactured under noncompetitive conditions and both enjoyed substantial tariff protection. The same

[110] *Ibid*, p. 7540.

[111] *Loc. cit.* Mr. Brayman was the director of du Pont's public relations department.

[112] In considering the probable effect of a price increase on cellophane earnings, the division manager stated the matter as follows: "Can we sell the capacity output of our plants? . . . The District Managers are divided in their opinion. . . . However, the majority of the District Managers, the Director and Assistant Director of Sales are of the opinion, barring a recession, the tonnage can be sold" *Ibid*, p. 7539. Although this reasoning is consistent with that of a monopolist interested in maximizing profits, Judge Leahy cited it as evidence that du Pont did not have the power to raise prices arbitrarily. *United States v. E. I. du Pont de Nemours & Co*, 118 F. Supp. 41, 179 (D. Del. 1953).

[113] Data are not available to compare du Pont's earnings from cellophane with the earnings of producers of other wrapping materials These are without exception diversified firms producing a variety of products. However, the record discloses that in every year from 1935 through 1942 du Pont failed to cover costs in selling cellulose acetate film, which it sold in competition with two other concerns (GX 490 through GX 497).

business management produced both products. The French Comptoir shared in the management of both Du Pont Cellophane and Du Pont Rayon until 1929. Yerkes, president of Du Pont Cellophane, was also president of Du Pont Rayon. Presumably du Pont in controlling business policy for both companies was actuated by similar business motives.[114] Both products have had several reasonably close substitutes. The production and consumption of both increased phenomenally.[115] Cellophane and rayon have been similarly characterized by rapidly developing technology, rapid reduction in costs, and rapid decline in prices.[116] The chief difference in the manufacture and sale of the two products significant to the course of profits apparently lies in the structure of the rayon and cellophane industries. Although rayon manufacture began in this country as a monopoly, rival firms came into the industry promptly. American Viscose Corporation began as the sole domestic producer of rayon shortly before the first world war and du Pont followed in 1920. By 1930 these concerns had eighteen rivals. As late as 1949 fifteen firms occupied the field. Although the four largest firms in recent years have usually accounted for about 70 per cent of the total output and although most of the firms have generally followed a price leader, Markham from his painstaking and exhaustive study concludes that freedom of entry and the pressure of substitute products have made the rayon industry workably or effectively competitive.[117] The course of both du Pont's and the industry's rate of earnings supports this conclusion (see Table IV). Federal Trade Commission data reveal that in 1920, when du Pont first produced rayon, American Viscose Corporation, until then the country's sole producer, realized 64.2 per cent on its investment.[118] Although du Pont showed a loss in

[114] The district court found. "Same individuals were the principal du Pont executives in du Pont Rayon Co. and du Pont Cellophane Co. Same policies of improving quality, lowering cost of production, and reducing unit price to gain greater volume of sales were followed as to both companies"; and that du Pont's "price policy for rayon was the same as for cellophane." 118 F. Supp. at 86.

[115] United States consumption of rayon increased by about 320,000,000 pounds between 1920 and 1938. Jesse W. Markham, *Competition in the Rayon Industry* (Cambridge, Mass., 1952), p. 230. Cellophane consumption grew by about 80,000,000 pounds between 1924 and 1938. DX 600, p. 1216.

[116] Rayon prices dropped from $6.00 a pound on February 1, 1920 to $0.51 a pound on July 29, 1938. Federal Trade Commission, *Investments, Profits, and Rates of Return for Selected Industries* (a special report prepared for the Temporary National Economic Committee, 76th Cong., 3d Sess.), 1941, p. 17985. Cellophane prices dropped from $2.51 in 1924 to $0.42 in 1938. DX 336, p. 642.

[117] Markham, *op. cit.*, pp. 181, 206, 208.

[118] Federal Trade Commission, *op. cit. supra* note 116, p. 17644. In this report the Commission's method of estimating rates of earnings on the basis of total investment is apparently similar to du Pont's method of calculating its operating earnings for its various divisions. See note 107 *supra*.

TABLE IV.—INVESTMENT OF PRINCIPAL COMPANIES IN RAYON, INVESTMENT OF DU PONT IN RAYON, INVESTMENT OF DU PONT IN CELLOPHANE, AND ANNUAL RATE OF RETURN BEFORE TAXES ON THESE INVESTMENTS, 1920–1938

Year	Total Rayon Investment of Principal Rayon Companies	Du Pont's Rayon Investment	Du Pont's Cellophane Investment	Average Rate of Return of Principal Rayon Companies (per cent)	DuPont's Rate of Return on Rayon Investment (per cent)	Du Pont's Rate of Return on Cellophane Investment (per cent)
	(millions of dollars)					
1920	$ 40.7			64.2		
1921	51.2	$ 2.9		42.0	(−2.1)	
1922	66.0	4.0		50.1	34.1	
1923	89.1	6.3		43.2	38.9	
1924	110.6	8.9		26.7	27.9	
1925	141.7	14.0	$ 2.1	30.6	34.2	36.7
1926	159.3	20.2	2.5	20.1	15.2	58.3
1927	166.7	24.4	2.7	25.8	27.0	44.8
1928	199.1	29.6	2.6	24.5	26.6	62.4
1929	228.0	38.4	5.1	18.1	19.0	55.8
1930	244.6	41.1	11.2	5.0	(−0.9)	39.9
1931	234.5	37.0	18.2	3.4	4.5	29.9
1932	223.2	33.5	21.6	1.5	1.2	18.0
1933	238.3	32.4	23.3	12.2	12.7	21.3
1934	249.9	38.7	24.0	6.9	8.6	24.9
1935	255.4	46.0	24.6	6.7	5.3	24.6
1936	267.0	50.0	26.3	11.5	11.0	29.1
1937	281.3	54.6	27.3	12.1	13.1	25.2
1938	296.6	61.7	30.7	2.5	4.2	27.5
Average Rate of Return				21.4	15.6	35.6

Sources: Rayon investment and earnings, Federal Trade Commission, *Investments, Profits, and Rates of Return for Selected Industries* (a special report prepared for the Temporary National Economic Committee, 76th Cong., 3d Sess.), 1941, pp. 17988, 17990, 17998. Cellophane investment and earnings based on Table III. Comparable data on total rayon investment and earnings are not available beyond 1938.

1921, its rate of earnings rose to 38.9 per cent by 1923. Thereafter its rate of earnings and those of the industry declined until by 1929 they had fallen to 19.0 and 18.1 per cent, respectively. When six more firms entered the industry in 1930,[119] average industry earnings fell to 5.0 per cent and du Pont suffered a loss of 0.9 per cent. During the following eight years du Pont averaged only 7.5 per cent on its rayon investment, and the industry as a whole put in a similar performance.

In striking contrast, du Pont with only a single rival in producing cellophane (and that rival's output closely geared to du Pont's) earned less than 20 per cent on its cellophane investment in only one depression year. From the beginning of the depression in 1929 through the succeed-

[119] Markham, *op. cit.*, p. 47

ing recovery and the 1938 recession du Pont averaged 29.6 per cent before taxes on its cellophane investment. On its rayon investment it averaged only 6.3 per cent.

IV. *Conclusions*

Apparently the cellophane market does not conform to the Chamberlinian model in which substitutes are so close that no producer may long enjoy monopoly returns—a "sort of ideal" equilibrium adjustment with the demand curve tangent to the cost curve at some point above lowest average cost. It does not conform to Clark's model of workable competition wherein rival products and potential competition reduce the slope of the demand curve, or to Robertson's model wherein substitutes are so close as to result in a competitive price. Rather, cellophane is so differentiated from other flexible wrapping materials that its cross elasticity of demand gives du Pont significant and continuing monopoly power.

Du Pont has used its power with foresight and wisdom. It has apparently recognized that it could increase its earnings by decreasing its costs and prices, by educating its potential customers to the benefits of wrapping their products in cellophane, by improving machinery for packaging, by helping converters and packagers solve their technical problems. It has built a better mousetrap and taught people how to use it.

But du Pont has not surrendered its monopoly power. Its strategy, cellophane's distinctive qualities, and the course of its prices and earnings indicate this. Du Pont's strategy was designed to protect a monopoly in the sale of a product it regarded as unique, and its pricing policies reflected the judgment of its executives on how best to maximize earnings. We think its earnings illustrate Knight's distinction between justifiable profits to the innovator and unjustifiable monopoly gains. They have been "too large" and have lasted "too long."

THE TAXONOMIC APPROACH TO THE STUDY OF ECONOMIC POLICIES

By A. C. L. Day*

All that is important in the study of economics is essentially concerned with the study of economic policies. To some degree or another, practically all economists are making statements of the form, "if you carry out such and such a policy, then you are likely to get these sorts of consequences." The number of economists who are solely concerned with completely detached analysis is very small, and even their thoughts are likely to be used by their colleagues as the basis of policy judgments. That this is so is probably quite right; there would be little justification either for the present number of economists or for the degree of respect with which they are regarded by the people who actually have to make decisions, unless they could provide fairly clear analysis and information upon which decisions could be based.

In these circumstances, it is important that economists should be clear about the nature of their statements on economic policy, the position of such statements in the study of economics as a whole, and about the best techniques for organizing the information that these statements can give. The purpose of this paper is to look into this question, with particular regard to the taxonomic, or classificatory, approach, which has been severely criticized in two powerful articles,[1] both of which were written as reviews of studies of economic policy which used that approach. The argument of this paper will be that the study of economic policy, by its nature, demands a use of the taxonomic approach, and indeed an extension of its use beyond its present employment.[2] That there are clear dangers in the use of taxonomy

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[1] Milton Friedman, "Lange on Price Flexibility and Employment," *Am. Econ. Rev.*, Sept. 1946, XXXVI, 613-631. Reprinted in *Essays in Positivist Economics* (Chicago, 1953), pp. 277-300. H. G. Johnson, "The Taxonomic Approach to Economic Policy," *Econ. Jour.*, Dec. 1951, LXI, 812-32.

It should be emphasized that this paper is not intended to express differences with Friedman's "positivist" approach as expounded in the first of the *Essays*; with the fundamentals of that argument I am in agreement.

[2] In, for example, J. E. Meade, *The Theory of Economic Policy*, Vol. I, *The Balance of Payments* (London, 1951), and Jan Tinbergen, *On the Theory of Economic Policy* (Amsterdam, 1952).

is apparent, and there can be no doubt that recent work has not avoided them all; some of them will be considered later in this paper. Moreover, simply because of the extreme complexity and changeability of the economic system, a reasonably satisfactory theory of economic policy must be a very considerable undertaking, which can never be complete and will never satisfy everybody. No doubt the best method of procedure in making up such a body of theory is to fill in, in detail, the parts of the system which seem to be of most significance or practical value, while being clear about where that part of the theory fits into the whole.

The view of the opponents of the taxonomic approach is that "if economic theory is to be applied to problems of economic policy, this can most usefully be done within the context of a particular problem occurring within a particular environment. Only so will full justice be done to the complexities of policy problems, and adequate attention paid to the necessity of economic measurement."[3] Friedman is less directly concerned with policy and more with analysis, but his peroration follows essentially the same line. "A far better way [than the taxonomic approach] is to try to devise theoretical generalizations to fit as full and comprehensive a set of related facts about the real world as it is possible to get."[4] Both writers regard it as the function of economics to look at the available facts about a *particular situation*, to devise theoretical generalizations from those facts, and to test and use those generalizations by forecasting from them. This position is more clearly expressed in Friedman's article than in Johnson's, largely because the former develops his case on taxonomy at much greater length than the latter. Although the final position adopted by both writers is broadly the same, the issue is somewhat confused by the fact that the main body of Johnson's article does not appear to be attacking taxonomy as such, but inappropriate taxonomy (for example, Meade's failure to consider the influence of the terms of trade on expenditure).[5] This contradiction may not in fact be as sharp as it can appear to be: it can be argued

[3] Johnson, *op cit.*, p. 828

[4] *Op. cit.*, p. 631.

[5] Much of Friedman's opposition is also directed more against misuse of the taxonomic approach than against the approach as such. With his attack on the creation of systems that cannot be empirically verified, there can be no basic disagreement This, however, is by no means the whole of Friedman's position; the disagreement of this paper is with the view that the taxonomic approach cannot be a useful tool of analysis, which is an interpretation that can reasonably be made of Friedman's position. For Friedman, the taxonomic approach inevitably involves the use of illogical devices and specious reasoning; the substance of the position represented by this paper is that such dangers are always present in economic theory, that they are shown up particularly clearly by the taxonomic approach, that they should always be avoided if economic theory is to be useful, and that useful economic theory must frequently be explicitly taxonomic.

with force, as Johnson does, that the taxonomic approach necessarily involves a risk of such shortcomings. Nevertheless, there is a shift of emphasis in the last two pages of Johnson's article, and both in order to avoid the confusions that this can cause, and because Friedman develops his thesis in more detail, the main burden of the disagreement in this paper will be directed against Friedman.

The method to which both authors are opposed involves the setting up of a system of different possible kinds of interrelationships between various economic factors—the setting up of a system of different possible worlds. For Friedman and Johnson, our theories and our analysis of policies should be firmly rooted in the facts as they are known at a particular time.[6]

It is convenient at this stage to distinguish two different kinds of taxonomy; formally, one is a particular case of the other, but for the questions on hand the distinction needs to be made. On the one hand, there is taxonomy which consists of the classification, in the form yes/no, of the answers to a series of questions about whether there is a direct relationship between two magnitudes which we must take into account in considering a particular economic system.[7] The other form of taxonomy considers the different numerical values that can be used to describe such relationships. This second type involves more detailed knowledge; in addition to saying a relationship cannot be regarded as zero, an attempt is made to say more precisely what it is, in quantitative terms. The taxonomic method, fully employed, makes use of both of these kinds of classification. It considers the differing logical consequences when one considers a certain relationship present from those *existing if it be assumed absent; and in addition it classifies the different* sets of consequences arising from different strengths of the relevant relationships.

The antitaxonomic position expressed in Friedman's article is largely based upon what seems at first sight to be an attractive analogy drawn from the physical sciences. It would be possible, he argues, for astronomers to explore an infinite number of interrelations between a variable number of planets, each of which could be of any size or density. They could imagine up an infinite number of theoretical systems, whereas in fact there is only the one real universe. Therefore, Friedman argues, astronomers derive hypotheses from this one set of

[6] This point is clearly related to the well-known differences between the National Bureau and the Cowles Commission approaches. This difference does not seem to be the core of the issue under discussion here, however, in the Universities-National Bureau *Conference on Business Cycles* (New York, 1951), p. 114, Friedman takes a judicially conciliatory position between the two extreme views.

[7] These statements are essentially of the form of the "truth tables" of logical theory, and are also the basic principles of botanical taxonomy.

observed facts,[8] test them, and use, reject, or extend them as appears to be justified. This nontaxonomic approach, moving back and forth directly between the observed universe and theory, is the one which Friedman recommends should be used by economists.

Unfortunately, here is one of those cases where analogies from the physical sciences can be misleading for the social sciences. The physical scientist can take it as reasonably certain for most of his problems that he is in the same world today as he was yesterday. Once he has determined the acceleration due to gravity or the specific gravity of mercury, he can rely on their constancy for all time. (He cannot, of course, *prove* that they will remain constant). The economist, even if he can ascertain the numerical value of a structural relationship (and that may be difficult enough because of the familiar problem that he cannot isolate bits of the world in a test tube), cannot rely on its remaining constant. Physicists would have to be more taxonomic if they could neither be confident about ascertaining the acceleration due to gravity, nor be sure that it would remain constant. As far as the economist is concerned. there is a large number of possible worlds. By the time he has decided what sort of a world he is in, and then has developed a theory to describe it, the world he is describing is likely to have changed.[9]

This is not a difficulty that can be attributed solely to shortcomings in economic science. It is a consequence of the fact that the activity we describe as "economic" is intimately linked with the rest of social life. It is impossible to isolate economic activity from the rest of human activity in such a way that the influences of the latter on economic activity will be simple and predictable. Economics cannot be autonomous, because we cannot be sure what economic world we shall be in next year, even if we are fairly sure that we can describe today's. In particular, technological and political change can have strong effects on economic parameters. Studies of economic phenomena must inevitably be "open-ended" from the point of view of the economist; any attempt to draw up a complete system showing the loops of causa-

[8] It is not my purpose here to follow up the criticisms that can be made, on the basis of Popper's work, of Friedman's theory of scientific inference in the natural sciences. On the criticism of the validity of the inductive method in the natural sciences, and the arguments for the hypothetico-deductive method, see J. O. Wisdom, *Foundations of Inference in Natural Science* (London, 1952). It should be noted in this respect that the initial essay in *Essays in Positive Economics* shows considerable differences in Friedman's position compared with his earlier paper which is under discussion here

[9] Awareness of these facts does not imply that we must abandon the Galilean mechanics of the world of mathematical models; it means that we must accept the limitations of a system which does not necessarily include any absolutely reliable "physical constants." Of course, this should not be taken as implying that it is wise to swing to the other extreme; "all is flux" is not a suitable guiding rule for the economic theorist, because it leads to an acceptance of the impossibility of any theory.

tion relevant to economic affairs must include sections of the circuit which pass into fields which cannot be the direct concern of the economist, such as the fields of politics and sociology.

The intimate linkage between economics and politics provides a strong reason why the number of possible worlds facing the economist is multiple. Many aims of policy seem, or at least may seem, possible to the politician; the economist must take these aims into account as a part of his system and therefore has to consider many different possible systems. As has been pointed out before, the analogy with economics on the side of the "true" sciences should not be physics so much as engineering. The engineer frequently makes use of taxonomy, implicitly or explicitly; his recommendations vary in accordance with the surrounding conditions of his project, and in accordance with what he is asked to do.[10] On the other hand, he has the advantage that he usually knows his parameters and can frequently work with quite large margins of tolerance.

The differences between economics and physics, then, are manifold. Even if economists were sure what the relevant relationships are, they could not verify their magnitudes with any great accuracy; even if their magnitudes could be verified, it could not be relied upon for practical purposes that they would not change; and even if the structural magnitudes did not change, the aims of policy would. It should be apparent enough why economists, if they are to make statements about policies, must be taxonomic and allow for a wide range of possibilities.

The method of the physical sciences has been described as one of movement directly back and forth between reality and theory. This can be accepted as an approximate description of scientific method in the natural sciences, even if the inductive method is not regarded as a description of the process by which those sciences are developed, and if it is considered that the valid description is the hypothetico-deductive method, in which the starting point is not reality, but a mental framework into which one's observations of reality are fitted with a greater or less degree of success, the framework being modified in accordance with its degree of success. In the physical sciences, the problems are simple enough, identifiable enough, and permanent enough to be developed in this way, by direct movement between hypothesis and observation.

[10] It is a commonplace in engineering textbooks to employ taxonomy in the form of graphs or tables showing the different numerical values of one variable that will be associated with differing sets of values of other variables. The same techniques are frequently used in the recommendations of practising engineers, often in statements of facts which are closely akin to those studied by economists: for example, considering the various possible costs, under varying assumptions, of various processes and techniques.

In the case of economics, however, the use of this simple method of moving directly back and forth between reality and theory is likely to be less profitable. It is by no means useless. Immediate testing, by appeal to a fairly broad glance at reality, can show the plausibility of very general hypotheses, such as Keynes' view that part but not the whole of an increase in real income will be spent. Moreover, the refinement of econometric techniques may, in time, make direct movement back and forth between reality and theory the normal method of developing quite refined hypotheses in economics; for example, by giving exact numerical descriptions of the consumption function. Generally speaking, however, such techniques have not yet been developed very far, and it seems very doubtful whether they can ever give anything like a full description of anything like all possible (as opposed to conceivable) worlds.

The dilemma facing the economist when he has to make statements on economic policy is that while he must remain ignorant about the full details of all the possible and relevant economic worlds, decisions about economic policy still have to be taken, and he, as an economist, will be expected to give his opinion about such decisions.[11] Two dangers

[11] The nearest correlate of economics in the physical sciences in this respect is probably meteorology. (On this, see G. Morton, pp. 272 *et seq.*, in *Faster than Thought*, edited by Bowden, [London, 1953].) Rapid judgments have to be made about changing, and in detail quasi-unique, situations. On the other hand, meteorological data can be collected quite quickly in relation to the length of the forecast period, and the basic physical laws are constant. An interesting comparison between meteorology and economics from the point of view of a professional meteorologist is found in O. G. Sutton, *Mathematics in Action* (London, 1954), p. 106. "This intricate nature of the meteorological problem is perhaps better realised by a comparison, not with astronomy, but with economics. Both subjects deal fundamentally with problems of energy transformations and distributions—in economics, labour produces goods and other forms of wealth and meteorology traces the distribution of energy from the sun. Both systems are affected by complicated and seemingly capricious external influences. Economics has to reckon with man in his infinite variety, meteorology with effects arising from the irregular character of the surface of the earth and the uneven distribution of water vapour in the atmosphere. We are painfully aware that there is no universally accepted theory in economics and very little hope of establishing such a theory in the present generation. In plain language, economics is too difficult to be developed quickly into an exact science, and much of the political strife of today arises from the refusal of enthusiasts to admit this simple truth. We may go further than this. In problems of economic behaviour variations in human psychology introduce disturbances of an apparently irrational (and therefore unpredictable) kind into any planned system, and for this reason it is doubtful if a genuine mathematical description of the whole economic field, with the implication of exact prediction is possible. Much the same arguments may be applied to meteorology. To bring the weather within the scope of exact mathematical analysis demands the formation of something approaching a universal theory of atmospheric motions. It is only rarely that universal theories appear even in highly developed subjects like physics, and research, for the most part, is directed towards the exploration of limited fields as they become ripe for exploitation. Quite apart from this aspect, however, there arises the possibility (as in economics) of extraneous random influences. We do not yet know how far unpredictable elements such as sunspots or bursts of cosmic radiation may affect atmospheric motions; if they play a significant part, weather is subject to an inherent indeterminacy which makes real long-range forecasting impossible."

face him here. He may drift towards an anti-intellectualist position, by regarding economic policy decisions as purely a matter of judgment or intuition, about which the theorist acting in a purely intellectual manner can be nothing more than usefully platitudinous, sitting as a father-figure admonishing greedy children by impressing upon them that they cannot have their cake and eat it. The position of judgment and intuition in the making of economic policy is extremely important: but this attitude unduly narrows the range within which the intellect can operate. Alternatively, the economist can continue to use his intellect, but apply it directly to the past rather than to the present and future. He can analyze a past situation or development in detail, but leave to the civil servant or the economic politician the task of deciding how relevant the description is to present circumstances. This is perhaps what might follow if Friedman's advice were followed extensively, and theoretical generalizations were developed which described as full a set of facts about the world as is available. Inevitably, a full enough set of facts will only be available about the world that is rapidly receding into history. This should not be taken as implying an antihistorical bias. Historical analysis must inevitably be a large and useful part of economics, but it is by no means all.

The process of development of economic theory has been, and must tend still more to be, a more complicated one than the movement back and forth between the real world and hypothesis or theory that characterizes the physical sciences. The difficulty that immediately arises is that many different relationships may conceivably be regarded as important in economic analysis, and it is very difficult to check how important they are and how serious would be the shortcomings of a model as a basis for analysis of real problems if a particular relationship were omitted.

The first stage in which taxonomy can be useful in economics is, therefore, at the stage of pure theory: the stage at which hypotheses are set up. It is impossible to provide as immediate or as unquestionable "verification" of the hypotheses of economic theory as is usually possible in the natural sciences.[12] Only very broadly, and largely on the basis of intuition and introspection, can the economist test directly whether his hypotheses fit with reality. At this stage, taxonomy can organize the assumptions of different theories.

Economic analysis must, because of the difficulty of testing, move into another stage—that of the consideration of the *logical entailments*

[12] It must be remembered that, strictly speaking, scientific hypotheses are never fully "verified"; at best, we can fail to disprove them. Despite this, it is difficult to deny the immense difference in the extent to which "verification" is possible in the physical sciences compared with the social sciences.

that follow from various hypotheses. When the matter is put in this way, of course, the description of the methods of the natural sciences already outlined appears rather *simpliste.* The natural scientist also goes through this stage of thought, in order more easily to see whether the full implications of his hypotheses fit in with his observations of the universe.

It is after this stage that the economist, together with other social scientists and to a large extent with the engineers, more openly parts company from the pure natural scientists. The multiplicity and changeability of possible important relationships in economics, together with the immense difficulty involved in verifying any of them, makes taxonomy of the second type distinguished earlier a necessary tool in the economist's box. In any of the more complex economic problems, there arise doubts about what are the magnitudes of the important relationships that are involved. In addition, the ever-present uncertainties about what reactions will occur which are important but basically unpredictable; of these reactions, political decisions probably make up a large part.

The purpose of taxonomy at this stage is to organize these possibilities in as systematic a way as possible. In a way, this may seem an unexciting occupation; it possesses neither the intellectual stimulus of pure theory nor does it seem to be right down to earth in practical facts. All the same, this work, which Meade has described as tool setting,[15] is essential once the problems become at all complicated. Here, then, is the place of taxonomy in economic method: it helps to make clear what relationships are being regarded as significant, and how they will interact when the relationships are regarded as being of certain magnitudes.

The next stage in the process of economic analysis is the department of the applied economist, who receives from the pure theorist, via the tool-setter, an organized set of possible interactions of various relationships which may be important. His task is to look at the real world and attempt, as far as possible, to find out what are the actual facts about the relationships; to see which relationships do appear to be important in a given situation and what are their numerical values. Inevitably, he cannot do this work fully Evidence will be subject to differing interpretations. Some evidence will be unobservable. Much will be verifiable only within large margins of error: it will be possible to eliminate some but by no means all of the rows and columns in the matrices of possibility provided by the theory of economic policy.

This is the stage where purely intellectual tools must fail us. In so

[15] *Op. cit.*, p. vii

far as facts on relationships are not fully available, different views can still be held on what relationships are important, and about the magnitude of these relationships; there will be several hypotheses or theories, or branches of a theory. On the other hand, in so far as applied economics provides reasonably incontrovertible facts, theories can be modified or dropped, and the irrelevant categories of possibility can be discarded. This failure arises particularly because policy decisions must still be made even though the full facts may not be available. Judgment and intuition must come to the aid of the intellect; assumptions must be made even though the facts are not certain. Here we are very near to the world of the civil servant and the politician; but the economist still has his place in helping to make recommendations that cannot be justified solely by appeal to intellectual argument and verifiable experience.

It is here, in the field of political economy, that another stream enters fully into the pattern, a stream which must influence decisions but is alien to the economist qua analyst. This is judgment about what are the desirable aims of policy; what are the political desiderata? This stream is an essential part of the decision-making process; it lies outside the province of the economist as such; on the other hand, it is most unlikely to lie outside his whole personality, for the simple reason that most economists are to some extent interested in changing (or preserving) the world. For these three reasons, it is very necessary that when making policy recommendations political economists should distinguish as honestly as possible between the normative and the analytical element in their judgments. How frequently, for example, has discussion on the highest levels of the policies of the Labour governments failed to distinguish between criticism of their aims and criticism of the methods by which those aims were being pursued? At the same time the analytical judgments whch are made by the political economist cannot all derive from economic analysis as such. Political economy is a branch of political philosophy which involves extensive use of judgments made by economists, and which is frequently indulged in by people who are also analytical economists.

Another temptation that must be resisted by the political economist is the temptation to discard all analysis, except perhaps the simplest, because it cannot provide full or unequivocal answers. This seems to be what Jewkes recommends,[14] and may well be the practical anti-intellectual consequence of the Friedman-Johnson type of attack on taxonomy. The taxonomic method, combined with careful logical analysis and with accurate and sometimes inspired observation of

[14] *Lloyds Bank Review*, Apr. 1953, pp. 18-32.

reality, can provide the firm intellectual foundation on which economic judgments can be based. Unless it is organized taxonomically, the range of possibilities is likely to be so bewildering as to induce defeatism, or to lead to unprofitable controversies where disagreements about relevance, about logic, and about orders of magnitude are hopelessly confused. Assumptions about the future and about the imponderables in the present have to be made;[15] the only way in which they can be organized usefully is by explicit use of taxonomy.

In fact, it appears that a great deal of the most useful work already done in economics has involved a considerable taxonomic element, although often only implicitly. The way in which matters have often occurred has been for two possibilities to be allowed, but for one to be considered as more important than the other, so that it is followed up more energetically. The danger in this procedure, which must increase, as problems dealt with become more complex, is that the possibilities that are implicitly excluded may be regarded as important by someone else; or some other person may lay more emphasis on some other possible relationship. The controversy about the effect of wage cuts on employment is full of such pitfalls for the unwary.

The present trend of economic theory must make either for more pitfalls of the same kind, or for complete lack of comprehension for all but the most agile mathematically, unless very full use is made of the taxonomic approach. For example, analysis of two-sector models[16] leads very easily, if assumptions are at all complicated, to solutions in the form of mathematical expressions which are difficult to decipher and impossible to understand intuitively, simply because of their complexity. When more than two sectors are described (and there can be little doubt that further extension of the analysis of a three-country world is one of the most important needs in international trade theory) the solutions become almost unmanageably complex, and one must accept either taxonomy or defeat. Nor is this the whole of the matter; it is probably fairly generally accepted that two of the most important lines of future development of macroeconomics are into dynamic analysis, and into consideration of nonlinearities. Here, the mathematics becomes so complicated that general solutions are frequently impossible. All that can be done is to assume a given set of numerical values for the various relationships and then calculate a solution. Frequently, the calculation of any particular solution must be such a

[15] And, no doubt, mistakes will frequently be made: for example, the mistakes in forecasting postwar consumption on the basis of prewar data

[16] Both in international trade theory and for the fuller description of a closed economy. On the latter, see Ralph Turvey, "Some Notes on Multiplier Theory," *Am. Econ. Rev.*, June 1953, XLIII, pp. 275-95.

lengthy process that it is possible only by electronic devices; the literature of this particular development is already beginning to grow.[17] In fact, it is practically impossible to say anything useful about analytical problems which are too complicated to be given a general solution, unless use is made of a taxonomic approach. By using taxonomic organization of these complicated problems, it is possible for the economist to obtain additional insight and understanding; on this basis, he can organize and develop the informed intuition, upon which most complicated policy recommedations must immediately be based.

The need, then, is not to throw taxonomy overboard, but to accept its real and growing significance and to point out the directions in which particular care must be taken in making use of this method. The theory of economic policy has to provide navigating tables to help policy-makers deal with the problems they meet. For two reasons, this metaphor of navigating tables seems to be a more useful one than those current. To talk in terms of maps[18] is to imply a very limited range of possibilities in a fixed, and in principle fully knowable, world; assumptions that this metaphor may do something to avoid. More important, it is suggested that the theory of economic policy could profitably present its solutions and its categories of possibility in the explicit form of sets of tables designed to indicate what will be the consequences of a change in one variable on the different variables that appear to be significantly related to it, on various assumptions about the sizes of these relationships.

Even in very simple models using comparative statics, assuming linearity in the relationships (*e.g.*, constant elasticities) and assuming small initial disturbances, such tables can be useful. As an example, the familiar Robinson-Lerner formula for exchange stability can easily lead to placing exaggerated emphasis on the stability conditions, and insufficient on the relative sizes of disturbances and effects.[19] Once comparative statics models start to become at all complicated, even if the linearity and small disturbances assumptions are retained, the need for a well-organized taxonomy, with tables considering the consequences of various numerical values of the relationships, becomes quite apparent. Many of the mathematical conclusions in the later parts of the Mathematical Supplement to Meade's *Balance of Payments* are of no clear significance in a purely mathematical form, and cannot conveniently be summarized verbally. Tabular or graphical representations of the various relationships considered, with each table or graph

[17] See the bibliography in A. Tustin's *Mechanism of Economy Systems* (London, 1953).

[18] See Jewkes, *op. cit.*, p. 29.

[19] On this point see my note "Devaluation and the Balance of Payments," *Economica*, Nov. 1950, XVII n.s., 431-37.

representing a particular model and each place in the table or point on the graph representing the consequences of a particular set of numerical values of the relationships, would provide a convenient and easily understandable summary of the various possibilities.

The obvious criticism of this recommendation is the amount of work that would be involved and the amount of paper that would be covered. This would be considerable: the work of the tool-setter of the constructor of navigation tables, is to some extent tedious. All the same, it is easy to imagine that the work involved is greater than it really is. The number of possible models is very large in relation to the number of relationships that are regarded as important; and since there can be no limit to the number of relationships that can be regarded as important, the work can never be finished. But this does not mean that the task is hopeless. In the first place, a large number of possible models deriving from a given number of important relationships will be logically irrelevant because the system will be under- or overdetermined, because the number of equations will not equal the number of the unknowns.[20] Secondly, it will be justified if circumspection is used to regard some models as more significant than others. There are dangers here, for example, of arrogating to oneself the duties of the applied economist or even of the politician, and of making improper use of the logic of inverse probability.[21] Care must be taken about these errors, but with proper care the task of setting up a useful set of tables can be brought down to manageable proportions. By classifying the tables in accordance with the presumptions of the models they represent, it should be possible to see at a glance what is assumed and what is not assumed to be a relevant relationship in any particular model. At this first level of classification, it is made clear what relationships are considered relevant in different models: at the second level, the consequences of different magnitudes of the relevant relationships.

The system can never be complete, because it is always possible to bring in additional relationships which may be regarded as relevant. For example, there is Johnson's criticism of Meade, that he fails to take account of the terms-of-trade effect on expenditure out of a given money income. Each such additional relationship complicates the general algebraic form of the solution substantially, and soon leads to unmanageable expressions. As has been already said, the only possible reactions at this stage are to accept defeat or explicit taxonomy.

Any further degree of complication beyond that attained in Meade's

[20] It is wise not to exaggerate the importance of this limitation, however. Since the number of relationships which can conceivably be regarded as important is infinite, the number of conceivably relevant models is also infinite.

[21] See Friedman, *op. cit.*, p. 625.

Balance of Payments can only be satisfactorily dealt with by classification of particular numerical solutions for particular sets of relationships. This conclusion applies with some force where the complication is an extension from a two-sector model to a multisector model, because although matrix algebra can supply solutions, such solutions in themselves do not help political economists very much. Still more does this conclusion apply when the extension is to cases where dynamic conditions are considered, and where nonlinearities are allowed.

Friedman and Johnson criticize the taxonomic method because it may lead to undue simplicity; the true position is that taxonomy is desirable because it is the only way of dealing with complexity, and of allowing for the importance and the uncertainties of economic measurement. The criticisms they bring against the taxonomic method as such are really almost entirely criticisms of economic analysis as such, or at any rate of oversimplified economic analysis. An apparent weakness, and a real strength, of taxonomy is that it shows up the shortcomings of oversimplified analysis. In so doing it points the road to be followed, and it provides the means by which we can proceed along that road.

The great strength of taxonomic arrangement of solutions, whether arrived at mentally or electronically, is that it is able to deal with these two major shortcomings of traditional macroeconomics. On the one side, A. W. Phillips' recent study[22] shows how taxonomic methods can present valuable insight into dynamic processes; on the other, the work of Tinbergen[23] and of Manne and Frankovich[24] are recent examples of indications of the possibilities of considering nonlinearities. The constant elasticity assumption is a useful one, and can be justified in accordance with Occam's Razor, but it is certainly not always justifiable, and involves dangers of imposing the limitations of our minds on reality. Where this assumption is not justified, it can be abandoned without impossible difficulties, if one is willing to use calculations of particular solutions for particular numerical values. Another way in which nonlinearities may be important is mentioned by Tinbergen: limiting conditions may apply to particular variations; in formal terms there may be kinks in some functions after movement of a certain magnitude away from the initial conditions. Consideration of such kinks is likely to be essential once the infinitely-small-changes assumption is dropped. The point of all this is that, while simple theories are desirable when they are adequate for the task on hand, there are many cases when it is all too clear that they are inadequate. The only positive way of

[22] "Stabilisation Policy in a Closed Economy," *Econ. Jour.*, June 1954, LXIV, 290-323.

[23] *Op. cit.*

[24] A. S. Manne and J. M. Frankovich, "Electronic Calculating Methods for Solving Excess Capacity Problem," *Rev. Econ. Stat.*, Feb. 1953, XXXV, 51.

dealing with these shortcomings is to complicate the models and organize the information they give taxonomically.

All this not to deny that there are dangers inherent in the taxonomic approach; these have been excellently analyzed by Friedman. Perhaps the biggest danger is that of using classifications with no empirical counterpart. Sometimes that procedure will be justifiable, as a reasonably close approach to reality; but extreme caution must always be used. The taxonomist must always be aware that his categories of possibility must be fitted against the test of observation of the real world, by the applied economist. This means that it may often be wiser to decline relationships in terms of actions of economic agents, rather than in terms of effects, with the exception that definition by effects may always be justified if it summarizes a set of relationships which are explained elsewhere, as in a more detailed model. If care is taken to see that relationships do have empirical counterparts, then the taxonomic model is subject to empirical testing. It is true that if it includes every conceivable possibility the model as a whole must include reality, and therefore cannot be contradicted as a whole.[45] But in significant senses a taxonomic model can be tested; relevant relationships can be shown to exist which are not in the model; some of the relationships explicitly included in the model may be shown to be unimportant and the parts of the model that are particularly important can be thrown into relief by attempts to define the order of magnitude of some of the relationships. Moreover, if care is taken to ensure that all the categories have empirical counterparts, it is possible to test which alternative within the total system is nearer to reality, in so far as empirical information can be obtained.

The danger of lack of clear empirical counterparts, with its ally implicit theorizing, is the greatest enemy of taxonomy, as of all economic analysis; there are also others, which it is worth listing. Care should be taken to be quite explicit about what one is doing when one steps outside the particular narrow part of the establishment of economic knowledge which is the province of the economic theorist. In particular, care should be taken to avoid introducing ethical and emotive judgments into purely analytical work; psychologically such complete separation is almost impossible, but honest taxonomy combined with self-awareness in the analyst can make such judgments

[45] *Cf.* Friedman, p. 628 This criticism can be overrated as a criticism of taxonomy as such. A statement of the form "it is either true or false that the sun is ten million miles from the earth" can be justifiably attacked on Friedman's lines. There can be no doubt that statements of this type have been used as the basis of unprofitable economic theorizing. But it cannot be said that taxonomic statements in economics are generally as sterile as this statement, especially in view of the lack of verifiability and the changeability of economic magnitudes which have already been discussed.

stand out for what they are.[26] Similarly, clearly organized classification can make judgments about facts on relationships stand out apart from analysis of the consequences of particular possible relationships. The fact seems to be that it is not that taxonomists are particularly subject psychologically to the dangers of "casual empiricism" and the "invalid use of inverse probability,"[27] but that these are the traps that beset all economic theorists but which are made particularly clear when the taxonomic approach is used. Similarly, taxonomy, unlike *ad hoc* theorizing, leaves perfectly clear the factors that one has considered, and therefore makes it quite obvious what one has not been able to consider.

These dangers attaching to the taxonomic method are real enough, even though they apply for the most part to all theorizing in economics. Nevertheless, useful advances in economic knowledge and useful influence on policy demand that the taxonomic approach should be given its proper place, to deal with problems that are beyond the powers of *ad hoc* theorizing or unaided intuition, and in which empirical verification is possible only to a very limited extent. Taxonomy permits the development of theories complicated enough to approximate to reality, it shows up the exact limits of our knowledge and the extent of our ignorance, and it allows us to organize and systematize what we can know about the uncertainties of the past and present and the immense range of possibilities of the future.

[26] Indeed, on the importance of such psychological motivations in some of the most important advances in economic theory, see Lange, "On the Scope and Method of Economics," *Rev Econ. Stud.*, 1945, XIII, 24.

[27] Friedman, *op. cit.*, pp. 623-25.

THE IMPACT OF LABOR DISPUTES UPON COAL CONSUMPTION

By C. LAWRENCE CHRISTENSON*

A rather common view of labor disputes in the bituminous coal industry is that they represent interruptions of production that have seriously reduced the supplies of coal for consumers. It is this view that is the subject of the current article. It is a sequel to an earlier study[1] which set forth the theory of the offset factor and applied it to an interpretation of the relation of time losses from labor disputes to the production of bituminous coal for the eighteen years 1933-1950.

Given a dispute limited to a portion of a multifirm industry with a common market and a margin of unused capacity outside the area of the dispute, the impact upon production might be totally and immediately neutralized by simple shifting of orders from firms concerned in the dispute to those which are not so involved. This is the offset factor in its current-transfer form. An empirical test showed that in bituminous coal mining after 1939, the growth of unionism and the shrinkage in unemployment brought a weakening in the power of current-transfer to cushion the impact of labor disputes upon the production of coal.

As the power of current-transfer is restricted, however, that of the time-shift form of the offset may become greatly augmented. Even if disputes encompass an entire industry so that current-transfer disappears, there may still be possibilities of great expansion in output before a dispute begins, and reclamation after the event: the anticipatory and retroactive features of the time-shift form of the offset factor. The record for 1942-50 showed that the offset factor had been in effective operation especially in the form of anticipatory time-shift. Hence U. S. coal production reached levels considerably above those for

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[1] C. L. Christenson "The Theory of the Offset Factor," *Am. Econ. Rev.*, Sept. 1953, XLIII, 513-47.

earlier years even while the amount of dispute time losses also was passing the highest recorded magnitudes.

Although this finding is accepted, it still does not follow that the large volume of coal produced during 1942-50 was sufficient to protect coal consumption from being impaired by labor disputes. In answering that question the matter of coal stocks relative to consumer requirements becomes crucial. Coal is a bulky commodity and about half the problem of making it available for consumer use is in getting it delivered. Hence, for practical purposes we may say that coal, once mined, is always stored by consumers or dealers. These stockpiles insulate against consumer hardship if interruption of deliveries results from mine production stoppages. It will be our central objective to examine these compensatory reserves in some detail.

First, however, some classification of consumers is required. Preliminary examination reveals great variations in consumption and suggests at least three different ways of classifying coal consumers:

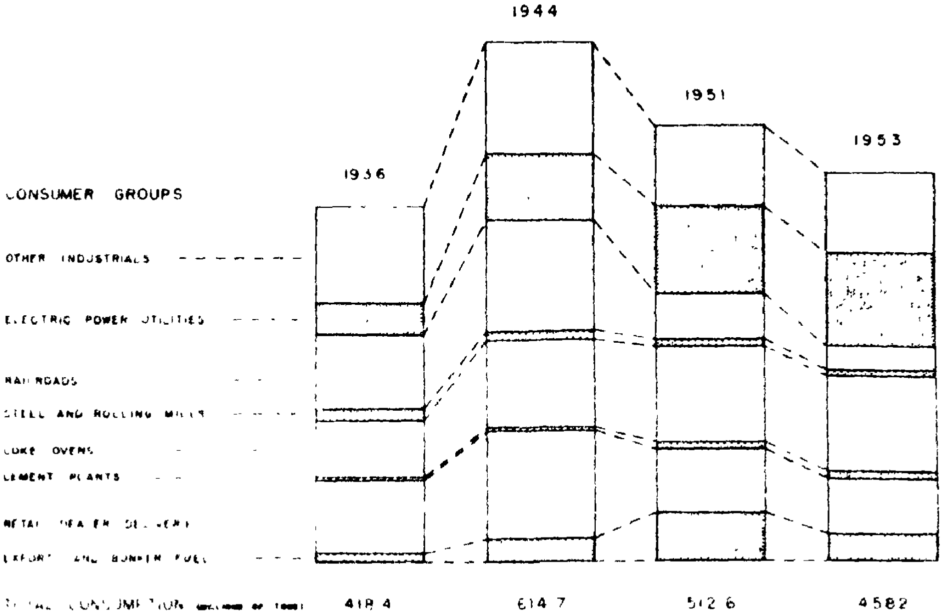
1. As to purpose of use: (a) productive-use consumers (*e.g.*, plants making durable goods); (b) final-use consumers (*e.g.*, households, schools or hospitals that burn coal for heating); and (c) compound-use consumers (*e.g.*, railroads using steam locomotives to supply freight as well as tourist passenger service).

2. As to availability of coal supplies: (a) market-access consumers (users that must buy coal from commercial mines); (b) direct-access consumers (industrial establishments operating their own coal mines); and (c) intermingled-access consumers (*e.g.*, railroads buying coal from on-line commercial mines).

3. As to continuity of coal use: (a) year-round consumers (*e.g.*, steel mills maintaining continuous operation); and (b) intermittent consumers (some industrial establishments, as well as households, that discontinue furnace use during summer).

This way of classifying consumers cannot allow for the actual variegated pattern of coal consumption. Neither can the available statistical record be fitted neatly into this classification. However, it is important for our analysis. It serves immediate warning that interruptions in coal deliveries will not be of uniform importance to all consumers, since both the possibility and relevance of compensatory reserves may be expected to vary, and hence the significance of the offset factor will also vary, for different consumer groups.

The consumption record used here is that which the Bureau of Mines has broken into eight consuming classes. Three of these (cement plants, steel mills, and coke ovens) are close approximations to productive-use consumers shown in our outline, while three others (electric power utilities, railroads, and the miscellaneous group called "other indus-



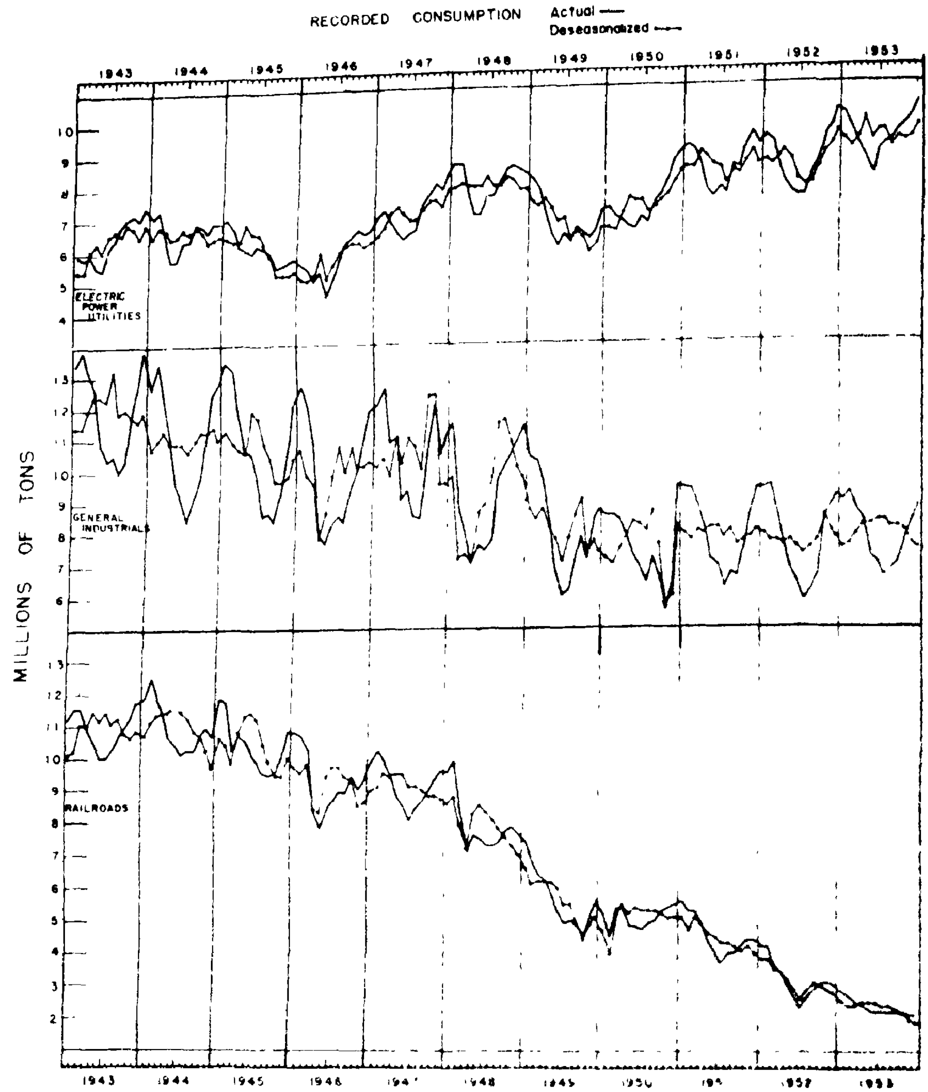
Source Mineral Market Reports, Bureau of Mines

CHART 1. AMOUNT AND DISTRIBUTION OF BITUMINOUS COAL CONSUMPTION
(four minor-dispute years)

trials"—these latter hereafter labeled "general industrials") contain mixtures of both productive- and final-use consumption. The remaining two represent still more heterogeneous composites. One is the estimate of total quantities of coal moved by retail dealers and the other is the amount of foreign shipments either for export or for use as bunker fuel. The small amount going into bunker fuel is similar to coal used by railroads, but there is no way of identifying the use of export shipments. Classification of coal moving through retail yards is not comparable with the other records of consumption, and identification of its specific use involves speculation. Retail yard deliveries are not truly estimates of current consumption at all but rather records of shipments for future use. Some such shipments go to small industrial plants, but probably most of them are for heating residential or small commercial and public buildings, hence should be considered as final-use consumption.

A summary review both of the aggregate volume of coal consumption and the relative importance of each of these large consumer groups in four minor-dispute years is presented in Chart 1.[2] The shrinkage of

[2] The term major-dispute month, as used here, means a month in which such recorded time losses in the coal mines amount to 300,000 or more man-days. A major-dispute year contains one or more such months while minor-dispute years contain no month with lost time of that magnitude. For an industry with 400,000 production workers, the bench mark of 300,000 man-day losses amounts to a loss of one day of working time for 75 per cent of the force. See Christenson, *ibid.*, p. 517.

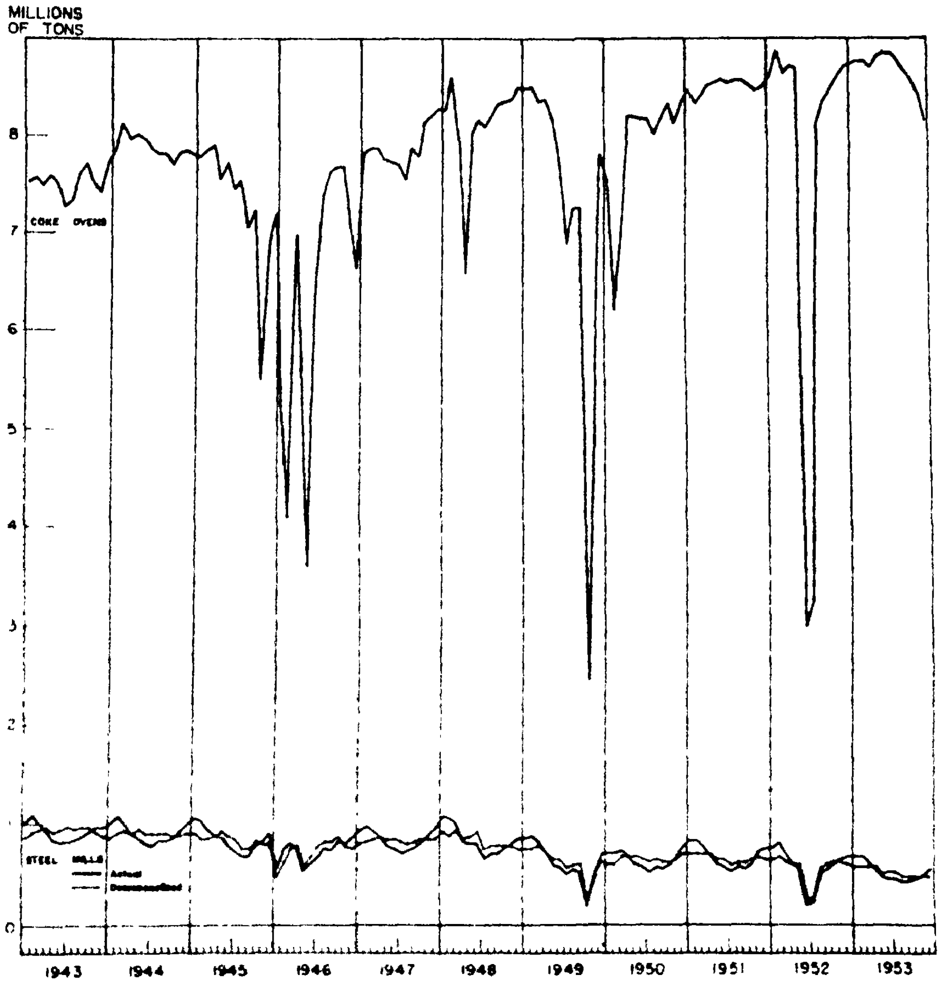


Source: Calculations from data of Weekly Coal Reports, Bureau of Mines

CHART 2. MONTHLY COAL CONSUMPTION—1943-53

total annual consumption from a peak of about 600 million tons in the war year, 1944, to a little over 450 million in 1953 was accompanied by substantial shifts in the relative position of the separate consuming groups.

Most prominent of these shifts is the both absolute and relative increase in the importance of electric power utilities along with a concomitant decrease in the position of railroads as coal consumers. Similarly, but a little less striking, is the increased consumption of coal



Source. Calculations from data of Weekly Coal Reports, Bureau of Mines

CHART 3. MONTHLY COAL CONSUMPTION IN COKE OVENS AND STEEL MILLS, 1943-53

by coke ovens and the more moderate reduction in coal use by general industrials. Steel mills as primary users of coal (apart from their coke consumption) have about held their own in absolute tonnage. Cement plants, although never large users, have increased both their absolute and relative positions. Both absolute and relative amounts passing through retail yards have shrunk considerably in the years since the second world war.

I. *Seasonal Patterns of Coal Consumption and the Timing of Disputes*

A. *Seasonal Patterns of Coal Consumption.* In examining the adequacy of reserve stocks as shelter against the impact of disputes upon coal consumption, the initial step is to seek some independent

measure of consumption requirements which may be regarded as normal, without distortion by production stoppages growing out of labor disputes. Since we do have seasonal temperature changes and since coal is a source of heat, the seasonal patterns of consumption and how the timing of labor disputes is related to such patterns are salient elements of our problem.

Separate twelve-month moving averages of actual consumption for each of the consumer groups were made for the entire twenty years, 1934-53. From these computations the figures for the seven years 1936, 1938, 1940, 1942, 1944, 1951, and 1952 were then used to construct individual seasonal indexes for electric utilities, general industrials, and railroads. Except for 1952, no major dispute time losses occurred in any of these years. While the time loss of a little over 2 million man-days in September 1952 injected an irregularity, there was no showing that consumption for any of these three groups was distorted by it.

For steel mills and coke plants there were the special problems of the major labor dispute in the steel industry in 1952, and the recession of 1938. Hence, for them seasonal indexes used are based on the years 1936, 1940, 1942, 1944, and 1951 instead of seven years of consumption records. These seasonal indexes for each of the five industrial coal users accounting for more than 75 per cent of total known consumption in 1953 are given in Table I.

Table I reveals some interesting differences in the seasonal consumption patterns. The amplitude of the seasonal swing is greatest for the general industrial consumers and least for the by-product coke ovens. The peak consumption month tends to be February, although electric utility and coke plant consumption are a little higher for January. The lowest consumption month is July for general industrial consumers, railroads, and steel mills. Coke plants and utilities, both with narrow amplitudes, reach minimum levels of consumption in March and April respectively. Disputes falling in March or April evidently take place when consumption has reached its minimum levels for some industrial users and started on the downward course for others.[8]

The indexes were next used to deseasonalize the actual consumption records of the period 1934-53. The result of these calculations, limited to the eleven years 1943-53 to simplify presentation, appear in Charts 2 and 3. This span covers all the major-dispute years since the orbit of unionism reached its widest limits with complete acceptance by consumer-owned mines at the close of 1941.

Chart 2 brings together for ready comparison consumption records

[8] A minor exception is cement plants which accounted for a little less than 2 per cent of total bituminous coal consumption in 1953. Their consumption pattern is highest during the summer months of intense building activity and lowest during the winter months.

TABLE I.—SEASONAL INDEXES OF COAL CONSUMPTION

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Electric utilities	109	107	96	89	89	93	96	102	103	106	107	107
General industrial consumers	118	121	110	101	88	85	80	84	87	98	109	116
Railroads	111	112	105	99	93	89	88	92	95	101	106	108
By-product coke plants	103	102	97	99	100	100	100	100	100	100	101	102
Steel mills	117	119	108	98	92	88	86	90	90	96	104	112

Source. 12-month moving averages using Bureau of Mines data for minor-dispute years. Considerable experimentation preceded preparation of this table All consumption (and production figures used later) were calendar adjusted so the expression "actual consumption" (or "production") always refers to these standardized monthly records After construction of consumption trend lines, crude seasonal indexes for each of the consumer groups were then made Later, twelve-month moving averages of actual consumption figures for each of the groups were broken into segments separating the major from the minor dispute years following the pattern of my earlier study but adding another segment (1951–52) to bring the materials more nearly down to date (see Christenson, *op cit.*, pp. 528–29; 542, n 27). Ratios of actual consumption to these twelve month moving averages were computed, and separate seasonal indexes for each of the segments for the different consumer groups were matched against each other This led to selecting the minor-dispute years as basis for the seasonal indexes which were finally used Rank correlations of the four final indexes used with those for each of the separate major-dispute year segments are as follows:

Years of Index	Electric Utilities	General Industrials	Railroads	Steel Mills
1933, 1934, and 1935	84	.96	.94	.57
1937, 1939, and 1941	.71	90	89	.92
1943, and 1945	81	87	90	.98
1946, 1947, and 1948	92	.76	.92	90
1949, and 1950	88	94	81	.87

of the three groups later presented in Charts 4, 5, and 6. These are predominantly market-access consumers, and are also those for whom the same seven years were used in construction of seasonal indexes. Chart 3 deals with users who are largely, but not purely, direct access consumers, and for whom the indexes rely on records for only five years. Since application of the coke plant index to actual consumption almost reproduces the original materials, only actual consumption for this group has been charted. Steel mill consumption of coal, however, does exhibit a clear seasonal swing not as wide as that for general industrial consumers. This is related to seasonal swings in steel ingot production shown years ago by Kuznets.[4] Although in recent years the high level of industrial

[4] Simon Kuznets, *Seasonal Variations in Industry and Trade* (New York 1933), pp. 252, 289-90, 299. Kuznets found that steel production before 1930 showed primary seasonal peaks in March and secondary in October, with troughs in July and December (p 252). The minor-dispute years, 1942, 1944 and 1951, are good periods to examine and to observe

output has reduced the amplitude, evidence of seasonal fluctuation still remains.

Distortions of seasonal patterns by other forces are clear. Even without numerical refinement both the general business cycle factors and the comparative consumption trends for the individual groups are evident. The participation in retreat from war production, and in reconversion which follows in 1945-46, is seen for all industrial consumers. So too is the common share in the postreconversion slump of 1949-50. The swelling wave of steel production during and after reconversion with the insistent reliance upon coking coals and the moderate decrease in the direct use of coal in steel mills appears in Chart 3.

Understanding of seasonal influences is of substantial significance for our study of compensatory reserves in two ways. First, stockpile ratios to consumption are a function of the consumption requirements as well as of the physical volume of reserve stock tonnage. Second, reserve stock tonnage which initially depends on mine production rests also upon the character of coal delivery facilities. The seasonal character of the latter is emphatic in the complete stopping of cargo shipments with the freezing of the Great Lakes; but to a lesser extent rail and truck shipments also become more difficult during winter months. This inverse correlation between seasonality of consumer demand and ease of delivery makes a substantial contribution to the need for stockpiling.

B. *The Timing of Disputes*. Against this background of seasonal variations we need to examine the actual timing of labor disputes in the mines. Table II gives a chronological listing of major dispute months for two decades divided into separate groups: those which came before August 1st, and those during the last five months of the year.

Of the 240 months in the period 1934-53, 38 involved dispute time losses in excess of 300,000 man-days. Twenty-one of the 23 major-dispute months on the left side of Table II fall between the beginning of spring (March) and the end of July when consumer demand is normally low. The other 15 in the right section of Table II, need to be differentiated in more detail. Four (in 1941 and 1945) involve time losses concentrated in the consumer-owned mines and hence could not have directly limited coal use by market-access consumers. Four of the remaining 11 are from the postreconversion slump year of 1949 when receding aggregate industrial demand for coal made the end of that year resemble, but of course not duplicate, the seasonal shrinkage customarily occurring in the spring. If it is true that seasonal amplitudes tend to be damped during periods of high-level operations, it also ap-

how this pattern of steel production has persisted, even though it was considerably damped since Kuznets wrote See also steel ingot production line in Chart 8.

TABLE II.—MAJOR-DISPUTE MONTH TIME LOSSES IN BITUMINOUS COAL 1934–1953

Year	Before August 1		After August 1	
	Month	Man-Day Losses in Millions	Month	Man-Day Losses in Millions
1934	April May	.97 .35		
1935			September October	2.0 .65
1937	April	.97		
1939	April May	4.2 2.8		
1941	April	5.2	September October November	.30[a] .31[a] .55[a]
1943	April May June	.35 .68 3.4	October November	.57 2.1
1945	April May	67 .35	October	3.0[a]
1946	April May	7.5 7.2	November December	2.3 1.7
1947	June July	86 .80		
1948	March April July	4.4 3.8 .63[a]		
1949	March June	2.1 1.5	September October November December	3.3 6.4 2.1 .63
1950	January February March	1.5 6.2 1.1		
1952			October	2.1
Total 23 months		57.53 million man-days	Total 15 months	28.30 million man-days

Source: File Records, Courtesy, Bureau of Labor Statistics.
[a] Supervisory and captive mine disputes.

pears that during a year of continuing general recession business lethargy saps most of the strength in the normal fall upswing before it has a chance to gain much momentum. This may easily go so far as to make the usual upturn only a small elevation above the summer trough. Such was indeed the 1949 pattern for much of American industry, and it was certainly the character of consumption for most of the industrial users of coal. December 1949 consumption instead of being near that for January, hardly reached that of April or May for any of the important consuming groups (see consumption lines of Charts 2 and 3). Hence the 4 major-dispute months of 1949 which came late in that year were almost as if they had appeared in the spring from the standpoint of their relation to the level of consumption. January and February, it should be noted, never appear as major dispute months except in 1950, and in this case they may be viewed as showing a moderated continuation of the lethargic industrial atmosphere of December 1949.

The seven months which remain, each with its millions of man-day losses, are:

Sept. 1935—2.0	Oct. 1943—0.57	Nov. 1946—2.3	Oct. 1952—2.1
Oct. 1935—0.65	Nov. 1943—2.1	Dec. 1946—1.7	

These seem to be the major-dispute months on the right side of Table II for which it cannot be said that general recession reduced an otherwise rising winter demand. Hence they must be subjected to special scrutiny.

The months just mentioned show a combined total time loss of almost 11 million man-days. If we leave out about 4.5 million man-day losses for disputes concentrated on the supervisory force or in consumer-owned mines, time losses for all other major dispute months of our two decades will add to just under 70 million man-days. Put more emphatically, over 85 per cent of time losses charged to labor disputes in coal mining during the two decades since 1933, were synchronized either with seasonally falling demand or business recession. This is a primary fact to be reckoned with in determining the adequacy of compensatory reserves. Certainly stockpiles held during such periods will not need to be of the same magnitude as would be required when consumption is expanding.

II. *Consumption, Reserves, and Market Access*

A. *Interrelation of Consumer Patterns.* This chronology of consumption and disputes needs supplementation by a picture of the aggregate monthly reserves of the separate consumer classes. This is first presented for the three groups shown in Chart 2. In 1953 they

accounted for about half of the total bituminous coal consumption. They are interrelated in that an important function of the electric power utilities and railroads is to provide service to the general industrials. For the most part they are all market-access consumers but there are significant qualifications. General-industrial consumers probably are more completely market-access consumers than are the electric power utilities or the railroads. Very few of them own any coal mines, nor are their operations geographically so located as to provide special availability of coal supplies. Some electric power utilities, however, are favored with ownership of coal mines and with physical location which distinguishes them from other users of coal who must turn to the commercial market.[5] About 10 per cent of coal used in 1950 by electric plants was supplied by company-owned mines. Even part of that which comes from independently operated mines represents fixed commitments from some mines based on long-term contracts. This may furnish special access not shared by hand-to-mouth industrial buyers.

In the coal-consuming family, railroads are blessed by having supplies within especially easy reach. Roads having direct access through title to coal fields, produced about 20 per cent of total coal used by railroads in 1950. However, considerably more than half of this was in the hands of four large western roads,[6] and hence could not influence greatly the distribution of coal supplies in the industrial areas east of the Mississippi River. More important than coal ownership is that the railroads are common carriers. This fact has two aspects bearing on our problem: the first is that by preparing to serve the public they also serve themselves. Roadbeds passing through the mining areas make possible what the coal trade calls "on-line railroad" sales. Moreover, by interchange connections with other roads having such facilities, the railroads possess an element of direct access even though they may be commercial buyers. The second is that as common carriers one important part of their coal consumption requirements is immediately reduced when coal shipments are curtailed. Hence, in their insulation

[5] A case in point is the extensive coal holding near the Dresser generating station on the Wabash River of the Public Service Co. of Indiana, Inc. Sometimes such companies may still prefer to turn to the commercial market for part of their coal in order to preserve their own resources or because their most convenient reserves are exhausted. See *1952 Annual Report of Public Service Co. of Indiana Inc.*, p. 7.

[6] The largest coal mining railroad is the Union Pacific with holdings in Wyoming. It is followed by the Northern Pacific and the Milwaukee Road with properties in Montana and Washington. These three account for about half the "captive" railroad tonnage. The Chicago and Northwestern mines in Illinois account for another 10 per cent. The remaining 40 per cent of railroad production (all east of the Mississippi) is that of the Norfolk & Western, the New York Central and the Erie Railroad. See *Keystone Coal Buyers Manual* (New York, 1954), p. 596.

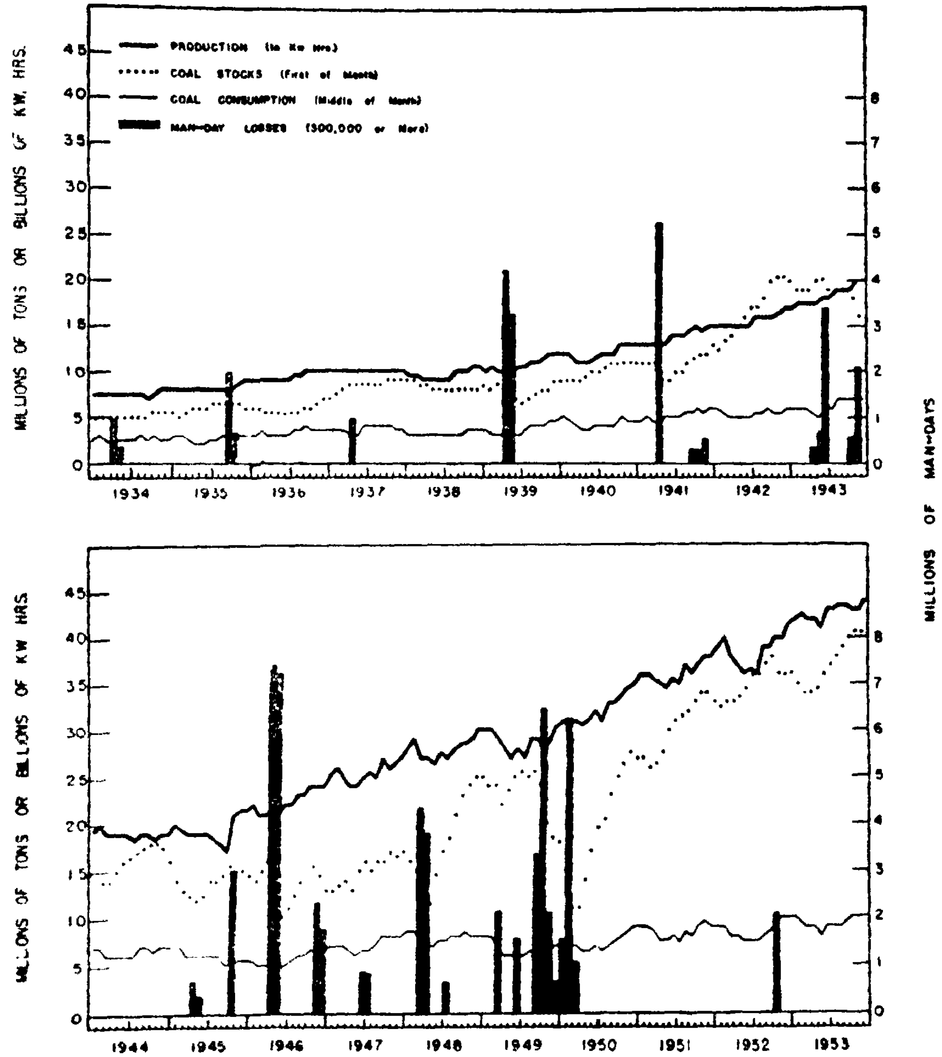
against the impact of the interruption of coal mining, the railroads occupy a special position.

B. *Compensatory Reserves of These Three Groups*. The relation of dispute time losses to the consumption and reserves of these three groups is shown in Charts 4, 5, and 6. The bars in each of the three charts showing time losses for all major dispute months of the two decades, are drawn to a uniform scale shown on the right in millions of man-days. The numerous small losses of minor dispute months are disregarded. Scales shown on the left represent the monthly consumption and beginning-of-month coal stocks in millions of tons.

The calendar-adjusted monthly coal consumption figures shown in the continuous thin line on each of the charts are plotted as of the middle of each month. Coal stocks, plotted as of the beginning of each month, appear in a series of dots representing the unadjusted stock figures as reported by the Bureau of Mines. The figures of electric power production (Chart 4) in billions of kilowatt-hours, and those for freight car loadings in millions of cars (Chart 6), similarly appear as heavy lines. Coal and coke car loading, however, are separated from all other freight loadings, and these are shown by the heavy broken line. No production figures comparable to kilowatt-hours or freight car loadings are shown for the general industrials (Chart 5). The broad inclusiveness of the Federal Reserve industrial production index makes it inappropriate for our purposes and a suitable independent index could not be devised.

C. *Relations of Disputes to Stockpile Ratios: Market-Access Consumers*. Comparison of individual group consumption patterns was made possible by Charts 2 and 3 (pp. 82, 83), but for this study the deseasonalized consumption records shown in the dot-marked lines are more important. If the seasonal patterns of the minor-dispute years used for calculation of the indexes were continuously repeated and left undisturbed by any other elements, then the dot-marked line of Charts 2 and 3 would cross the recorded consumption line in March or April and would lie above that line for all spring and summer months until crossing the consumption line again in the fall. Reference to the charts reveals no such simple pattern. Each of the groups shows elements of seasonal variation in all years, but no uniformity.

The purpose of deseasonalization is to aid in testing the impact of disputes upon consumption. Our seasonal indexes based on figures for minor-dispute years show high correlation with similarly constructed ones using records for major dispute years, but the possibility of impaired consumption may still be concealed. Also since other forces have modified seasonal patterns our use of the deseasonalized figures must be



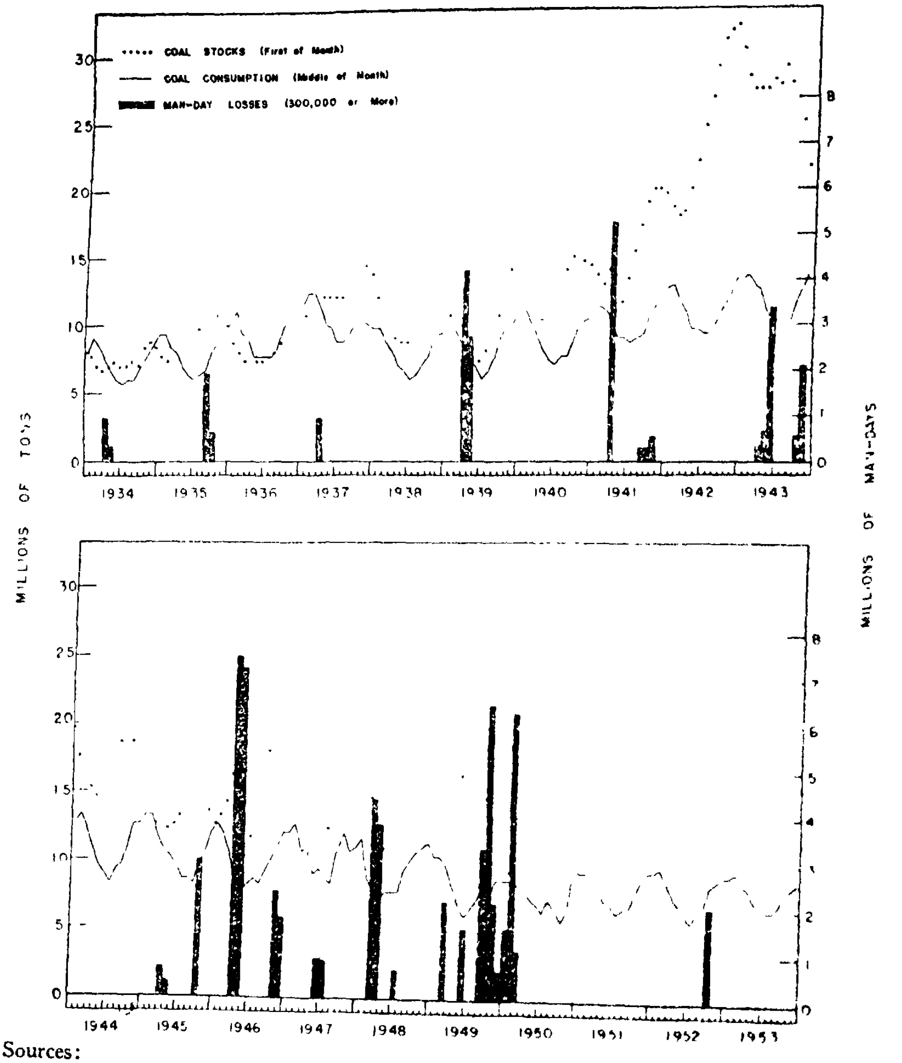
Sources:

Man-Day Losses: File Records, Courtesy Bureau of Labor Statistics.
Consumption & Stocks: Weekly Coal Reports, Bureau of Mines.
Kw Hrs Electricity: *Survey of Current Business.*

CHART 4 MAJOR-DISPUTE MONTH MAN-DAY LOSSES IN COAL MINES RELATED TO ELECTRIC UTILITY: PRODUCTION, COAL CONSUMPTION, COAL STOCKS

discriminating and supplemented with such other aids as we can find.

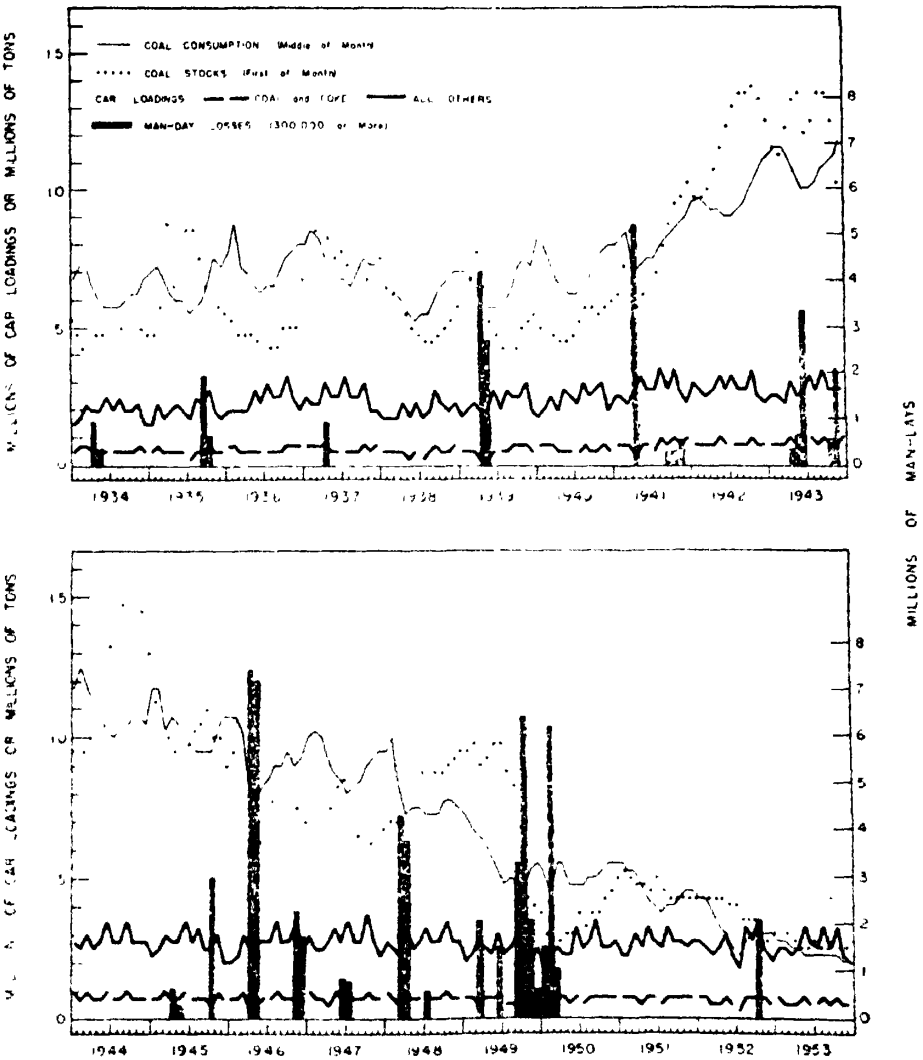
The primary test used is the ratio of recorded coal stocks for each separate consumer group (Charts 4, 5 and 6) to deseasonalized consumption. All reserves for future use must be acquired in advance of exact knowledge of what the future will be. A calculated ratio of 100



Sources:
Man-Day Losses: File Records, Courtesy Bureau of Labor Statistics
Consumption & Stocks: Weekly Coal Reports, Bureau of Mines.

CHART 5. MAJOR-DISPUTE MONTH MAN-DAY LOSSES IN COAL MINES RELATED TO GENERAL INDUSTRIAL: COAL CONSUMPTION, COAL STOCKS

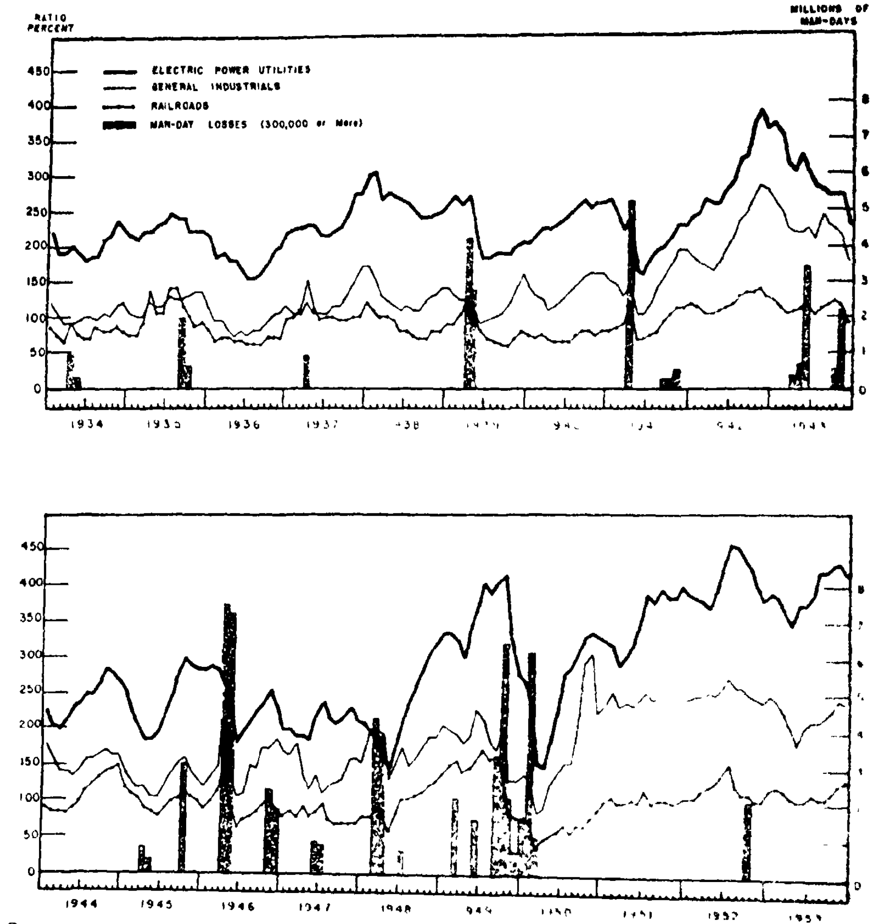
per cent represents a stockpile for that consumer class adequate to maintain a subsequent month's actual consumption adjusted by our seasonal index. Such ratios would always understate actual reserves when deseasonalized consumption was in excess of actual consumption and overestimate them during months when deseasonalized consumption was less than actual consumption.



Sources:
Man-Day Losses: File Records, Courtesy Bureau of Labor Statistics
Consumption & Stocks: Weekly Coal Reports, Bureau of Mines
Freight Car Loadings: *Survey of Current Business.*

CHART 6. MAJOR-DISPUTE MONTH MAN-DAY LOSSES IN COAL MINES RELATED TO RAILROAD: FREIGHT CAR LOADINGS, COAL CONSUMPTION, COAL STOCKS

If consumers kept a constant ratio of stocks to accurately anticipated consumption, then calculating stocks as ratios of deseasonalized consumption would transfer the seasonal pattern to the stockpile ratios. Under such ideal circumstances increases of these ratios above the seasonal course, just before or during dispute months, would indicate consumers' reliance on the anticipatory feature of the offset factor by



Sources:

Man-Day Losses: File Records, Courtesy Bureau of Labor Statistics

Ratio Calculations all based on data from Weekly Coal Reports, Bureau of Mines

CHART 7. RATIOS OF CONSUMER STOCKS TO DESEASONALIZED COAL CONSUMPTION WITH MAJOR-DISPUTE MAN-DAY LOSSES IN SOFT COAL

augmentation of compensatory reserves. Disruption of standard seasonal consumption patterns, however, and lack of any conclusive evidence that all consumers do tend to maintain constant reserve ratios preclude expectation of such neat results.

With the warning against anticipation of exact measurement, Chart 7 is introduced. Here is a twenty-year view of the monthly ratio of coal stocks to deseasonalized consumption for the three industrial groups that are primarily market-access consumers. Superimposed are the bars showing man-day losses in major dispute months.

Examination of that portion of Chart 7 which covers the years prior to 1943 reveals that all the major-dispute time losses, except for those of 1935 and 1941 (the latter in the consumer-owned mines), fall in April or May. October 1935, with 650,000 man-day losses, is the only one of the major-dispute months of these years before 1943 when deseasonalized consumption is slightly under the actual consumption for all three of these consumer groups. During all major-dispute months prior to 1943, and for all three of these consumer groups, the calculated stockpile ratios may be taken as conservative estimates of the relation of inventories to requirements. Once this is known, attention can be directed at the ratio calculations themselves.

It is not true that the calculated ratios rise at the beginning of the major-dispute months for all three of these consumer groups in the years before 1943, but there was some movement in that direction. In so far as such movement did occur, it was the railroads, customarily with the lowest reserve ratio, that led the movement. During all years prior to 1943 railroad stockpile ratios were pushed up sharply in advance of major-dispute months. Although ordinarily carrying reserves calculated at rarely above 95 per cent and frequently as low as 60 per cent, the railroads moved to more sheltered positions with ratios in the major-dispute months usually well over 100 per cent. Their added protection was, of course, partly due to reduced requirements because of curtailed coal shipments. The upward movement of ratios for electric power stations and general industrial coal users in major-dispute months during those years, although evident, appeared as a small hummock on a downward sloping seasonal hillside and suggest little more than constant maintenance of already established security positions (Chart 7). Earlier study found the pre-1940 period one when the current-transfer offset factor manifested substantial power.[7] In such periods even complete closing down of some mines can hardly generate much concern among coal consumers. Our ratio calculations now reflect this security of consumer positions.

For all three groups an entirely new pattern of coal consumption appears in 1943. New heights never experienced during any other part of the 1933-42 decade were reached and coal reserves more than kept pace with this upward surge of consumption (Charts 4, 5, and 6). One has to go back to the minor-dispute year 1942 to get the proper perspective, for all through that year the stockpile ratios continued to mount with hardly more than casual relation to the natural heat of summer (Chart 7). By December 1942, the stockpile ratios for electric power utilities and general industrials had reached the unprecedented

[7] Christenson, *op. cit.*, pp. 529-31.

figures of 364 and 280 per cent respectively. While railroads with a maintained continuously well about 100 per cent for all twelve months. earlier, they had never before closed a year when reserves had been maintained continuously well above 100 per cent for all twelve months.

The year 1943, therefore, opened with all three groups having greater shelter from interruptions in fuel deliveries than they had ever known. Moreover, although generation of electric power rose more or less continuously from month to month (Chart 4) thus diluting the seasonality for that group, both general industrials and railroads exhibited the normal seasonal amplitude (Charts 5 and 6). Hence for the major-dispute months of April, May, and June the calculated ratios of Chart 7 substantially understated the actual margin of consumer safety. However, while the high stock ratios of January were followed by their usual spring decline, there is also a suggestion of the quest for unnecessary additional safety as the ratios for all three groups rose to meet the anticipated production curtailment of June, when disputes were to account for 3.4 million man-day losses.[8]

The 1943 dispute time losses of October and November were among those identified in the more critical list earlier (p. 00). Of smaller magnitude than those of May-June, they came when the seasonal increase in coal consumption was under way. Hence the calculated ratios overstate the safety margin in October slightly and in November still more. However, this is also true for the ratios of the similar months of 1941 and 1942. While the 1943 ratios are not equal to the unprecedented ones for 1942, nevertheless, for all three groups they are distinctly in excess of comparable figures for 1941. Even in those critical end-of-the-year months of rising consumption, therefore, the impact of coal mine disputes could hardly have impaired fuel consumption for these groups. Reference to the absolute patterns of consumption and stocks shown by Charts 4, 5, and 6 seems to strengthen this conclusion drawn from the ratio calculations.

The first two years of our second decade are the high-production war year 1944, marked also by only minor-dispute time losses in coal mining, and 1945, initiating postwar reconversion. In contrast to 1944, the latter year was one of industrial recession beginning in the spring. Although 1945 time losses were sufficient to class April and May as major-dispute months, they were not of large magnitude. They represented sporadic outbursts rather than any general interruption of coal mining, and earlier study showed them having no effect on total coal production.[9]

Viewing the matter from the consumption side we see further evi-

[8] *Ibid.*, pp. 536-37.

[9] *Loc. cit.*

dence of the negligible influence of time-shift during the first half of 1945. The March, April, May ratio calculations for utilities, general industrials, and railroads show an undisturbed pattern of seasonal shrinkage (Chart 7) with no suggestion that any of these coal consumers were concerned about building up compensatory reserves as shelter against later retardation of deliveries. The continued effect upon our calculation process both of the general downward recession and of the reconversion shift of the seasonal consumption trough is the real explanation of the high October ratios rather than anticipation of possible stoppage in coal deliveries.

Added to reduced industrial consumption because of reconversion, the labor disputes outside coal mining in the last quarter of 1945 and the first months of 1946 augmented that proportion of coal mined during those months which could be directed toward reserves by freeing it from current use. Such accumulation of reserves in advance of the 1946 disputes of April and May did actually take place. While the calculated ratio for electric power utilities rose slightly in February to 288 per cent and sagged to 264 in April, those for general industrials and railroads, at 119 and 92 per cent in January, rose sharply to 208 and 157 respectively in April (Chart 7). It is certain, however, that the ratio calculations for these particular months understate the safety margin for electric utilities and also overstate it for the other two groups. No other disputes in the recorded history of bituminous coal mining involved as large time losses as those for April-May 1946, and the continuation through the second month drastically reduced reserve stocks. Thus the June ratios calculated 182, 106, and 66 per cent respectively for these three groups. These June figures, made against a deseasonalized summer line, are conservative. They seem to be the narrowest safety margins to which these three groups had ever been subjected. Even so, ratios comparable to them had occurred frequently in the past. The low June-July ratio against deseasonalized consumption can be easily observed in minor-dispute years as well (Chart 7). It appears, therefore, that even the major-dispute time losses of April-May 1946 caused no impairment of consumption patterns of these three groups.

This conclusion concerning the impact of the disputes during the first half of 1946 is still more emphatically true for the disputes of the close of that year originally identified as deserving special scrutiny. In November, when dispute man-day losses in coal were about 2.3 million man-days, freight car loadings other than coal and coke were 3.5 million cars, which was the highest November figure reached during the entire two decades. December car loadings, usually a little under those for

November, were not so striking in comparison with other years, but they were in excess of those for 1945 and matched those to come in 1947 (Chart 6). Production of electric power was held at about 24 billion kilowatt hours for each of the three months of the last quarter, a higher level than had ever before been reached (Chart 4). The calculated ratios of stocks to deseasonalized consumption, slightly under those for November and December of 1945 in the case of the electric power utilities, were above the 1945 figures in both months for the general industrials, and in the case of railroads they were distinctly above in November although slightly under for the month of December. Reviewing the record in retrospect, it is clear that the ratios were more than adequate to prevent any impairment of consumption, for in both months and for all three consumer groups they were well above the ratios effective during the year 1947 when reconstruction was completed and production had moved on to new heights. Looking over the whole of 1946, therefore, whatever else may be said about the trials of industrial reconversion, we find no evidence that hindrance of deliveries because of dispute time losses in the coal mines ever impaired consumption of these industrial market-access consumers.

The disputes of 1947 call for little attention. Of small magnitude, timed at the middle of the year, they never had the potentiality of impeding coal deliveries to the same extent as those of 1946. Consumption in 1947 was maintained at high levels and stockpile ratios were also high enough to meet consumption requirements.

The year 1948 contains mild forebodings of things to come. While industrial production indexes continued to advance over those for 1947, the advances were so slight that, toward the end of the year at least, they might have been accounted for by the always possible element of statistical error. Specifically so far as industrial coal use was concerned, growth in markets clearly had been arrested. Coal consumption by the electric utilities took an unusual downward course during the last quarter of the year, minimum monthly consumption by general industrials was reached two months earlier than usual, and railroad use exhibited a much sharper than customary spring seasonal drop not followed by the normal postsummer increase. In part, the change in railroad use may be attributed to the continued dieselization program; but more than that was involved, as freight car loadings other than coal and coke for most months of the year were noticeably under those for 1947 (Chart 6). An aspect of these changes in industrial coal use is that they again probably lead to some understatement of the electric utility ratios for the major-dispute months March and April, while overstating them for general industrials and railroads. But com-

pared with ratios for the same months in earlier years, they were clearly adequate to meet consumption requirements (Chart 7).

If the time losses of July 1948, which occur in consumer-owned steel company mines, are postponed for later examination, we come then to the major disputes of 1949-50. The larger meaning of the statement that 1948 contained forebodings of things to come now stands out sharply. July 1948 was not merely the usual midyear signal for the seasonal upswing in stockpile ratios; it was the start of the building of a mountainous accumulation that did not reach its summit until the last quarter of 1949 (Chart 7).

The 1949 episode was not, however, a duplication of the 1942-43 demonstration of the ability of the great productive power of the bituminous coal mines to more than keep pace with increasing industrial demands. It was rather a showing of the sluggishness of the mines' reaction to the continuing fall in consumers' requirements. The repeated dispute time losses during 1949, even when supplemented by the union-ordered three-day weeks of July, August, and September could not produce any shrinkage in the calculated ratios. Only the rising consumption requirements of the winter months, with substantial time losses of October 1949 and February 1950, brought the ratios down to levels comparable with those for similar months of earlier years. It is indeed true that by March 1950 the ratio of reserve held by railroads fell to 40 per cent, which was the lowest calculated for the entire twenty years. Even then it is hard to be convinced that any impairment of service took place because of lack of coal supplies, for freight car loadings (other than coal and coke) beginning at low levels in January rose noticeably both in February and again in March. A critical examination of the records for 1949-50, therefore, leads to the conclusion that the stocks of market-access industrial consumers were always adequate, and for most months much more than adequate to meet requirements.

Even though originally listed as calling for special scrutiny, the 2.1 million man-day time losses of October 1952 can now be disposed of with little more than bare recognition. Coming as they did after the steel mill dispute of June-July had facilitated increases in coal stocks during the summer, the time losses of October produce nothing more than a welcome shrinkage in these excess reserves (Chart 7).

III. *Consumption, Reserves and Direct Access*

A. *Steel as the Fourth Member of Industrial Coal Consuming Family.* Each of the three members of the coal consuming family examined thus far was found to have peculiar properties of its own. The

steel industry also, with its subsidiary partner the coke plants, requires special analysis.

Only a small part of the coal entering into manufacture of steel is used directly as mined coal. A much larger part is used after processing in coke plants. Most of this great volume of coke used in blast furnaces is produced in ovens operated by steel companies or their subsidiaries which are referred to as furnace plants. A portion, varying between 8 and 19 per cent, is purchased from independent commercial plants.

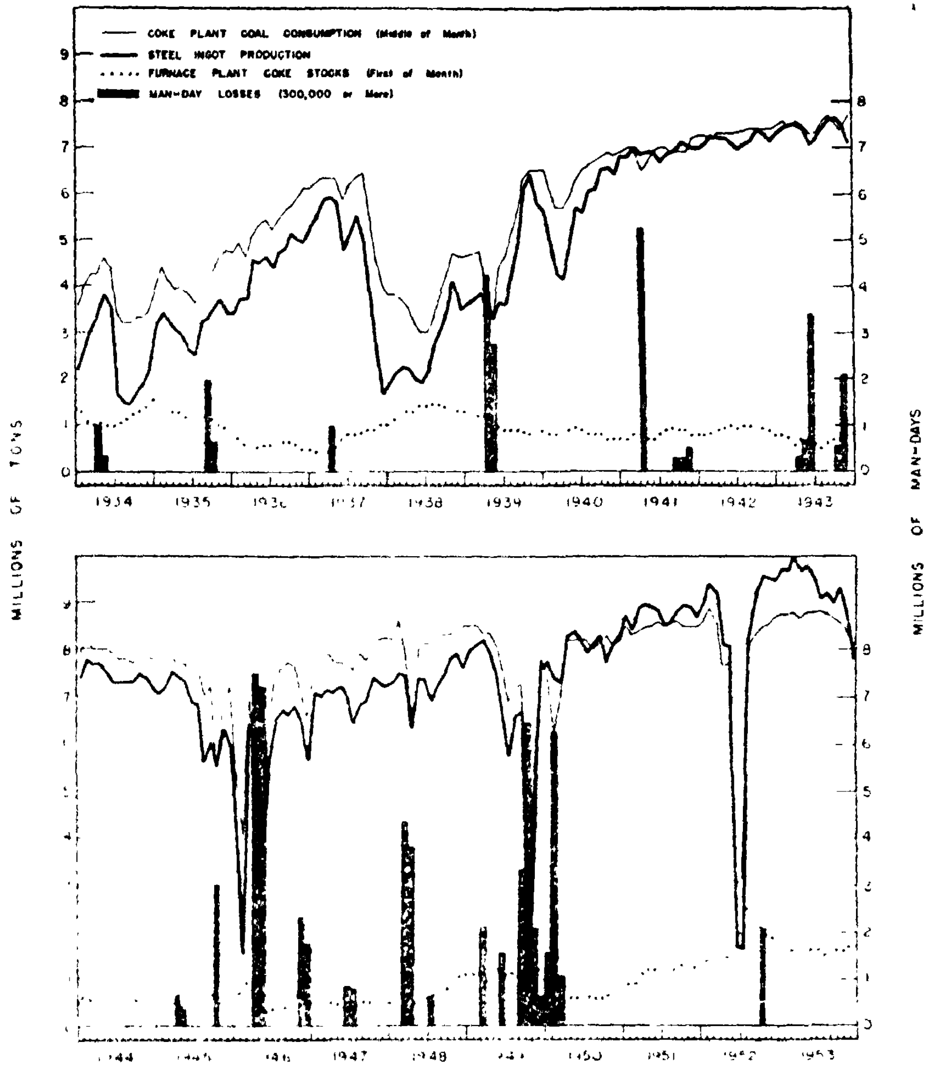
If about 15 per cent of coal used in producing coke goes outside the steel industry, then a round number estimate gives 100 million tons of coal consumed in 1953 for steel production, or 22 per cent of the total bituminous coal consumption of that year. A little less than 40 per cent of the total coal used by the steel industry is purchased from commercial markets and somewhat more than 60 per cent comes from mines operated by the steel companies or their subsidiaries.[10]

With existing technology, coking coal is indispensible in the manufacture of steel.[11] Combining steel with coke plants and locating both in close proximity to coal mines is clearly advantageous. Given these physical relationships, vertical ownership is an easy although not inevitable connecting link. Thus the steel industry becomes the major direct-access consumer.

B. *Compensatory Reserves of Steel Mills and Coke Plants*. Chart 8 is a variant of those presented earlier (Charts 4, 5, and 6) although it reproduces identically the man-day loss record. The coal consumption record, the thin continuous line, is that for by-product coke ovens only. It therefore excludes the small amount of coal processed in beehive-type ovens, and that portion of raw coal used as it comes from the mines to the steel plants. On the other hand, it does include coal used in commercial by-product ovens for production of some coke that is consumed outside the steel industry. The heavy continuous line represents the total production of steel ingots in millions of tons The reserve stock figures are shown in a series of dots at the beginning of months as in the earlier charts. However, in Chart 8 we show, not reserve stocks of coal, but rather, reserve stocks of finished coke at furnace plants. This does not include all the coke available to the steel industry, since it does not cover that portion ready for delivery from the commercial merchant plants. It has the advantage, however, of giving an indication

[10] For confirmation of these estimates the author is indebted to Mr. Harry Moses, President of the Bituminous Coal Operators Association. (Letter dated April 23, 1954)

[11] My suggestion as to limits of substitution of other coals is based on Voskuil who writes: "Only metallurgical coke can be used for reducing iron ore to the free metal" Walter H. Voskuil, *An Economic Study of Fuels in Manufacturing*, Circular Series No 63, University of Illinois (Urbana, 1952), p. 17



Sources:
Man-Day Losses: File Records, Courtesy Bureau of Labor Statistics
Coal Consumption: Weekly Reports
Coke Stocks: Monthly Coke Report, Bureau of Mines
Steel Production *Survey of Current Business*

CHART 8 MAJOR-DISPUTE MONTH MAN-DAY LOSSES IN COAL MINES RELATED TO STEEL INGOT PRODUCTION, COKE PLANT COAL CONSUMPTION, FURNACE PLANT COKE STOCKS

not simply of raw coal reserves but of those which have already gone through the ovens and are hence ready for immediate use at the steel mills. Later, in a different way, the coal stocks held both by steel plants and those of the by-product coke ovens as preprocessed reserves will be examined.

Chart 8 shows that the tonnage of coal consumption at coke ovens corresponds very closely to steel ingot production. Usually the tonnage of coal consumption at the by-product ovens has been somewhat larger than tonnage production of steel. That this has not been true since 1949 is probably a reflection of the shrinkage in the use of coke for other purposes and of expansion in steel manufacturing.[12] It should be noted that the three greatest reductions in the level of steel production for the last ten years of our record, namely those of February 1946, October 1949 and June-July 1952,[13] were associated with disputes in the steel industry itself, rather than with stoppage of coal mining. In Chart 8 the fall of steel production associated with the dispute over steel pension plans in October 1949 also exactly overlaps the bar showing losses of 6.4 million man-days in coal mines for that month, but it does so independently, not because of the interruption in coal mining.

C. *Relation of Disputes to Stockpile Ratios: Direct-Access Consumers.* Steel mills and coke plants are not only the best illustrations of direct-access as well as of productive-use consumption, but they also possess special characteristics as to the continuity of operations. Since there is little of blending with final use, the operating pattern is only indirectly associated with temperature changes. Hence seasonal variations of consumption are moderate, and almost fade out at times. Observation of these relations was made years ago by others.

Since the work of Kuznets,[14] and Åkerman it is recognized that variations in seasonal patterns between industries may also be accompanied by deviations in these patterns from year to year. Moreover, Åkerman emphasized that deviations from regularity associated with the boom phase of the business cycle tend to be most marked in the capital-creating industries.[15] These are the very industries we have called productive-use consumers and of which the steel industry is the most nearly perfect example. Hence from this standpoint alone, we must expect the steel industry to exhibit less of security against stoppages in the mines growing out of seasonal shrinkage in demand.

Other matters also complicate our problem in the case of the steel industry. Inability to separate monthly output as well as time losses for the consumer-owned mines from the aggregate figures for all mines

[12] See U.S. Bureau of Mines, Monthly Coke Report M.C.R 311 Supplement and Feb. 5, 1954 Mineral Market Report 2186 (July 1953).

[13] The 1946 dispute stoppage in steel was from January 21 to February 15. In part concomitant with it was the dispute stoppage in the automobile industry from Nov. 22, 1945 to March 13, 1946; the steel dispute of 1949 began Sept. 30 and was settled Nov. 11, while that for 1952 extended from June 3 to July 24.

[14] *Op. cit.*, pp. 253, 338.

[15] Johan H. Åkerman, *Economic Progress and Economic Crises* (London, 1932), p. 42.

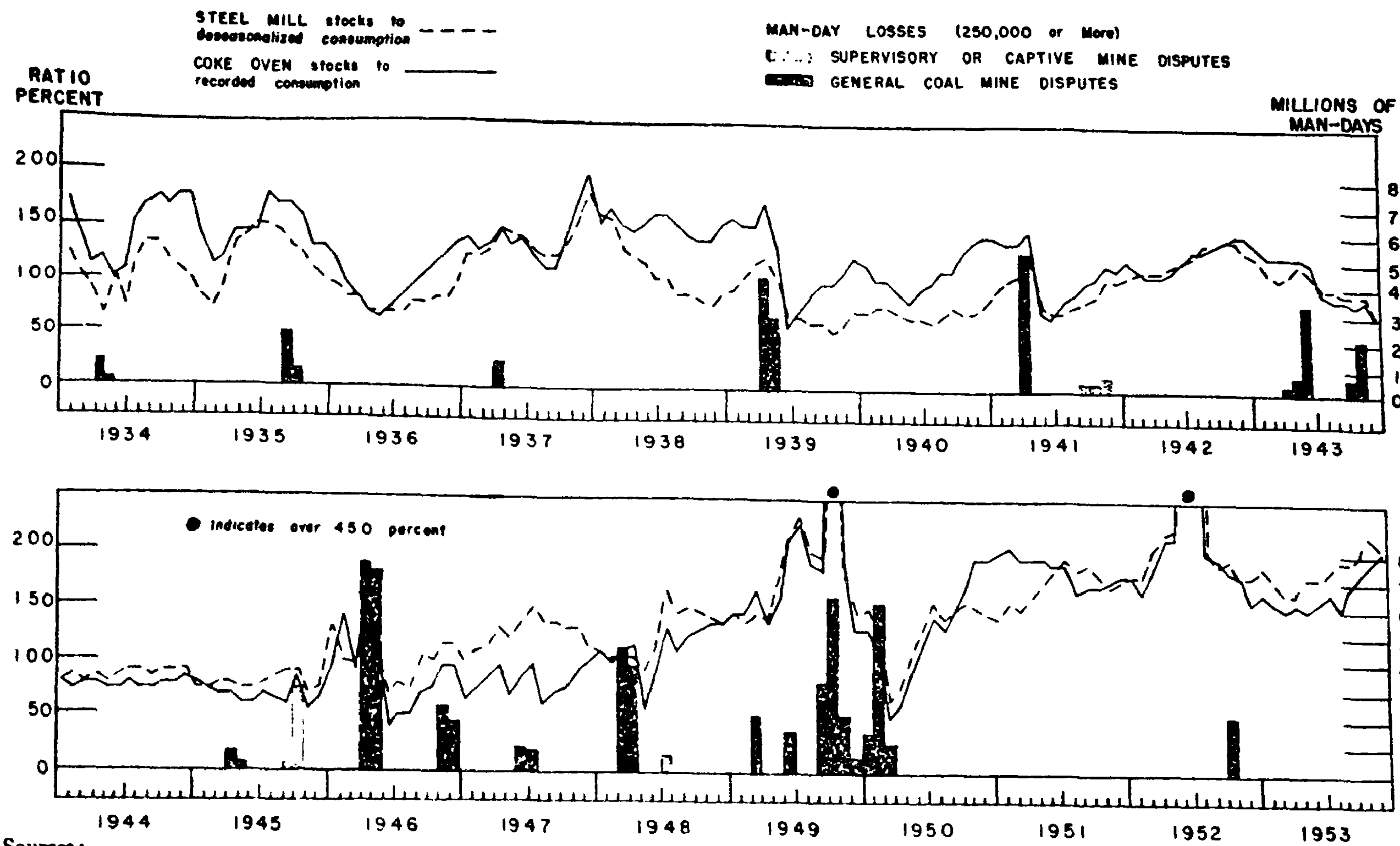
results in an underestimation of the potential current-transfer existing within the commercial sector.[16] With regard to the impact of disputes upon coal consumption in the steel industry, however, this handicap becomes still more serious for the following reasons: (1) the "captive" mines in steel have been affected by all major time losses since 1941; (2) most of the coal used in the steel industry is special-grade coking coal, available only from limited areas. Both of these factors reduce the significance of the current-transfer offset factor to very nearly zero. Hence examination of stockpile ratios for steel mills and coke plants calls for still more careful scrutiny than does reviewing the record for other consumers.

Chart 9 seems the most suitable view obtainable from the available materials. The bars showing dispute months are smaller than those of Chart 7 because of scale modifications. By lowering minimum time losses to 250,000, the September 1945 dispute which accounted for 290,000 man-days has been included. The September 1945 time losses are the only ones that do not appear in the other charts, but a distinctive shading has been used for the 1945 supervisory dispute, as well as for those of 1941 and 1948 known to have been confined to the steel companies' coal mines. All the others are shown as they appear in Chart 7 and are called general coal mine disputes. Except that actual consumption instead of the deseasonalized figures was used in case of the coke plants, ratios were calculated in the same way as in construction of Chart 7. The black dots outside the chart frame indicate omissions of ratios over 450 per cent due to the steel disputes of 1949 and 1952.

Still more so than in the earlier case, Chart 9 needs to be read with its companions, Charts 3 and 8. Since more than 80 per cent of the coal used in steel manufacturing must first go through coke ovens, the full picture of the impact of dispute time losses in coal mining upon the steel industry requires the combined examination of coal stocks at the ovens and the reserves of finished coke. The small time lag between the availability of coal at the ovens and of finished coke at the blast furnaces may be neglected. The Bureau of Mines Coke Section reports of stocks held by furnace plants, used to construct Chart 8, certainly understate the safety reserves of the steel industry since some portion of the merchant plant holding is available to steel mills. For our analysis it is these conservative estimates of coke reserves, the monthly steel ingot tonnage (Chart 8), and the coal ratio for the by-product coke ovens (Chart 9) which are considered most significant.

Putting together the observations of these three items for the period

[16] Christenson, *op. cit.*, pp. 519, 546.



Sources:
Man-Day Losses: File Records, Courtesy Bureau of Labor Statistics.
Ratio Calculations all based on data from Weekly Coal Reports, Bureau of Mines.

CHART 9. RATIOS OF STOCKS TO COAL CONSUMPTION BY STEEL MILLS AND COKE OVENS WITH MAN-DAY LOSSES IN SOFT COAL

before 1945 yields nothing new. It is the same pattern of complete security from disturbance by coal mine disputes which has already been seen for market-access consumers. Its repetition, even with slightly different details, would prove monotonous, and raise doubts as to the merits of giving these direct-access consumers any special attention. Such doubts, however, recede as the 1945 record is examined and disappear entirely when the disputes of later years are re-examined.

Understanding of 1945 requires re-emphasis on its character as a reconversion year, and also upon the peculiar position of steel in the reconversion process. It would probably be correct to say that more than any other single industry—unless it might be aircraft manufacture—the steel industry felt the full force of reconversion. The effect was a gradual one, however, and steel production remained high during the first quarter of the year although slightly lower than during the corresponding months of 1944. The scattered time losses of April and May appear not to have disturbed steel production in any way.

The supervisory disputes of September and October were different, as they directly affected the steel-owned mines. Although September involved only 290,000 man-day losses, after spreading to other mines the recorded losses in October were over 3 million man-days. Stockpile ratios at coke ovens which, except for a few midyear months earlier and the high production war year 1944, had never been permitted to fall below 75 per cent, sagged from 78 per cent at the beginning of 1945 to barely 62 per cent by September 1 (Chart 9). The rise to 84 per cent at the beginning of October was due to a drop in coke-oven consumption for that month rather than to any augmentation of coal supplies. Thus one may surmise that a part of the reduction in steel tonnage in October 1945 was a result of the coal shortage growing out of the supervisory dispute of that month.

The first point in analyzing 1946 is that the high stockpile ratios of January and February (steel mills, January—128; coke ovens, February—139) resulted in part from the reduced coal consumption because of the steel disputes. However, the growth of absolute volume in coal stocks while the mines were working and steel plant operations were reduced drastically, was very substantial. First-of-month coal stocks at steel mills rose from 600,000 tons for January to over a million tons by April, and coke-oven coal stocks advanced from just under 5 to 8.2 million tons in the same period. The figure in both cases was the highest for that month since the banner year 1943. Applied to April deseasonalized consumption for steel mills and to the coke oven actual consumption, these stockpiles represented ratios of 130 and 148 per cent respectively, in spite of the return of steel production to 83 per cent capacity in March. Drastically reduced coal mining, because of 7.5

million man-day losses during April, left steel plants and coke ovens with approximately half as much stocks beginning on May 1 as they were holding at the close of the first quarter. But the dispute in coal continued through the second month, and May involved almost as large man-day losses as April. The May 1 stockpiles, in ratio terms, were favorable (104 in steel mills, and 115 per cent in coke plants) only because of a sharp drop in coal consumption during May with a concomitant fall in steel output to just under 4 million tons. The restoration of some mining during May was insufficient to prevent a still further reduction in stocks, and June opened with steel-mill storage under 500,000 tons and coke-oven supplies of 2.5 million, the lowest on record for the entire twenty years. Finished coke reserves at furnace plants, after climbing during the first quarter to just under a million tons, were down to less than 300,000 tons by June 1, which also represented a twenty-year minimum. All these elements suggest that the immediate impact of the disputes of April-May in 1946 brought reduction in current steel output.

However, it seems inappropriate to attribute any of the drop in steel production during November and December to coal-mine stoppages in these months. The rise in the ratios, during the last half of 1946 is reliable. If one overlooks the huge reserves on April 1, coal stocks at steel mills and ovens as well as finished coke at furnace plants, both on November 1 and again on December 1, represented almost the largest absolute tonnages held during any months of the year and were adequate to have supported a considerably larger steel output had it been called for. Probably the same can be said for the coal supplies available at midyear both in 1947 and in 1948. This was true even though the July dispute of 1948 was concentrated on steel company mines.

We cannot be so confident that shortage in coal supplies made no contribution to reduction of steel output in April of 1948. While our stockpile ratios at the beginning of both March and April were somewhat over 100 per cent, it must be remembered that steel production in the first quarter of 1948 was running at about 7.5 million tons monthly. Therefore continuing large coal supplies were essential to maintain such ratios. Moreover, although the dispute losses in the coal mines were not as large as those of early 1946 they still were over 4 million man-days in each of two months. The first of these was March, which tends to be the peak of steel production and therefore also is the month when high consumption makes accumulation of coal reserves difficult. Coal stocks at coke plants of 8.8 million tons on March 1 became 7.4 by April, and 4.3 on May 1. A part of the reduction in steel tonnage from 7.5 million in March to 6.3 in April, therefore, may have to be

charged to this shrinkage in coal supplies which grew out of the time losses in the mines during those two months.

The three months, October 1945, May 1946, and April 1948 are the only ones in the entire twenty-year record when there may be strong reasons for concluding that some impairment of coal consumption and hence of current steel production resulted from stoppages in the bituminous mines. However, even with this conclusion established it does not follow that there was a forced reduction in *total* steel tonnage if one grants the possibility of production shifts through time. As direct-access and productive users of coal, steel mills, with subsidiary coke ovens, appear as the most conservative of all industrial consumers in the maintenance of reserve stocks, except railroads. This is partly because for direct-access consumers the most economical storage is to leave coal where nature put it. The other side of the story, however, is that a productive-use consumer may have the alternative of storing coal as a semifinished product. Hence the immediate rational adjustment to anticipated interruption in supplies may be to move all available coal through the coke ovens and also perhaps augment steel ingot tonnages as well. One needs to think of a blast furnace not merely as *using up coal* but also of *putting it into* steel. The anticipatory time-shift form of the offset factor on the coal production side then becomes expanded to include advances in steel output by productive-use consumers.

However, even such advance steel production might not be adequate to provide complete protection from reduced coal supplies if disputes extend beyond a single month. But this is the very situation to which the retroactive feature of the time-shift form of the offset factor is applicable. This retroactive feature is of no significance to final-use consumers. No one would claim that large coal supplies for household heating during the mild month of May are effective compensation for having endured shortages during bitter winter months. But increased steel production in May can make up for reduced output in April especially if fabricating plants can be furnished with extra inventories.

An important element of this argument is the fact that even during boom periods, steel plants rarely operate at calculated full capacity. "Full employment" in the tremendously productive American economy does not mean continuous employment of all workers in every industry, and it is a fantasy to claim that what is not produced today cannot be produced tomorrow simply because we do not know how to measure the exact amount of tolerance.

Although we must be content with something less than conclusive proof, fortunately the record does permit a demonstration of the reasonableness of this view. If we re-examine the record for our three identified months, the following picture is revealed. Steel was at 69, 52,

and 80 per cent of capacity in October 1945, May 1946, and April 1948 respectively. For October 1945 this represented absolute output of 5.5 million tons. In spite of the fact that the supervisory dispute had already begun, the tonnage for September was almost 6 million and significantly above that for August. Moreover, after the conclusion of the dispute, the swift rebound in coal supplies and consequently in steel production made November close with steel output of almost 6.3 million tons or about 5 per cent above that for September. Had it been possible to interchange the production figure of September with that of October, the year 1945 would have shown a typical seasonal pattern with primary and secondary peaks in March and November, respectively, a main summer trough coming late, with another in December, and the whole skewed by the slow downward course of reconversion. Hence it becomes plausible to say that the supervisory disputes of 1945 did not reduce steel production at all, but perhaps they did shift the monthly timing.

The 1946 case is complicated by the fact that the dispute in the steel industry itself during January and February meant operations of 50 and 20 per cent of capacity respectively in those months. However, the output in March passed 6.3 million tons: higher than in any of the last six months in 1945 except July. Even though coal production during April came as near to a complete stoppage as it has ever done before or since, steel tonnage (5.9 million) almost reached that of March. But for reduced operations at the beginning of the year, April steel production might have been regarded simply as the spring retreat following the normal primary peak in March. It was, however, the continuation of the coal dispute through a second month that forced reliance upon the retroactive feature of the offset factor. The rapid rise of steel output following the settlement of the dispute disregarded the customary summer trough and continued upward month by month until November (Chart 8).

The contention that reduced output in April 1948 was counterbalanced by increases for other months of the year is sustained more easily. The spring 1948 coal stoppages extended through two months beginning in the middle of March and extending to the middle of April. In magnitude of time loss they were only a little more than half as large as those of 1946 and there was clear advance notice of them early in February.[17] Furnace-plant coke stocks on March 1 reached the largest absolute quantities since the closing months of 1946. In this setting the steel plants operated closer to full capacity operations during all three months of the first quarter—including the major dispute

[17] See Colston Warne, *Labor in Postwar America* (Brooklyn, 1949), pp. 384-85.

month of March—than in any other first quarter since the banner war years 1942-44. Thus the view that depletion of the large coal and coke reserves by keeping steel mills operating at 95 per cent of capacity during March amounted to creating 7.5 million tons of ingots as embodied coal is thoroughly consistent with the facts.

Not only was first-quarter production large enough to make possible tolerance of more than customary spring shrinkage in April; also the rebound after resumption of coal mining was very fast. May production was back to the March volume and all the other months for the rest of the year—including the July vacation period—showed the same kind of superiority over the corresponding months of the earlier postwar years as had been exhibited during the first quarter. Certainly this cannot be regarded as positive proof that, had there been no reduction in April output, total annual production in 1948 would not have been still larger than it was. But a more qualified conclusion does seem reasonable; reduction of steel output to 80 per cent of capacity in April was made up for in large part by operating at considerably above 90 per cent for most of the other months of the year.

A minor addendum is called for concerning the steel industry and the large time losses during 1949-50. The growing volume of furnace-plant coke reserves along with concomitant fall in coal consumption at the coke ovens during 1949 can be seen clearly in Chart 8. They furnish conclusive proof that the disputes in the coal industry could have had no responsibility whatever for falling steel production. Even the continuation of dispute time losses into 1950 would have failed to reduce huge reserves to customary levels but for the sharp increase in steel output at the turn of the year (Chart 8). There remains only a faint possibility that the large time losses of February 1950 may be assessed with some responsibility for the slight reductions in February-March steel output (7.3 million tons for each of these months) below the January level (7.8 million). If such a charge were considered seriously, reliance on the retroactive feature of the offset factor furnishes more than adequate reply; both April and May steel production reached higher levels (approximately 8.3 million in each month) than obtained during any other months in what later came to be known as the year of Korea.

IV. *The* Total Analysis: *Seasonality, Compensatory Reserves, and the Offset Factor as Consumer Shelter*

A. *Omitted Items.* This analysis covers approximately 75 per cent of the coal consumption. However, there is the possibility of some individual hardships within our separate groups which could not be identified by methods used in this study. Supplemental examination,

while yielding no conclusive evidence, suggests that allowance needs to be made for the possibility of consumer inconvenience in some individual cases.[18] Moreover, it would be a mistake to assume that the remainder of total consumption is unimportant. The omitted 25 per cent is made up of cement plants, the foreign buyers—including shipping companies—and domestic buyers purchasing through retail yards. Little information is available as a basis for estimates of the foreign buyer requirements or of reserves available to meet them. Lack of information must also restrict the conclusion about the position of the consumers who rely on retail yards. Records permit only the crudest guesses of coal accumulated in household bins during the summer and fall months. Review of estimated stocks of the retail dealers barely touches the problem. Neither do available materials permit construction of any very satisfactory seasonal index of household consumption. Simple average calculations of seasonal movement of recorded retail deliveries during the years 1942-50 show July as the trough and February as the peak months with the range from 68 to 148. Probably the actual range in household consumption is much wider than these figures suggest. In general, it is reasonable to say that since the timing of labor disputes has in the past come when requirements of final-use consumers have been falling sharply it is extremely doubtful that they have contributed to any impairment of the consumption patterns.

The cement mills represent a small group of productive-use consumers whose seasonality is definitely out of phase with other industrial patterns. This should tend to make them vulnerable to the spring interruption of deliveries. However, relative to the total demands of industrial users their requirements are small; their peak demands come when they meet with a minimum of competition for the services of the mines, and if there were small curtailments in spring cement production, the retroactive feature of the time-shift form of the offset factor would be especially applicable.

B. *The Combined Meaning of the Analysis.* Apart from the men-

[18] In response to direct inquiry, communications were received from public school officials in the following states Conn (1), Colo. (1), Ill (5), Md (2), Mich (1), Va (5), Utah (1). The replies are almost all to the effect that they have no evidence of stoppage of school service because of coal shortage The notable exception is the case of four teachers colleges in Illinois required to curtail operations during February 1950 by government order. However, the official of one of these colleges wrote: "Our situation was such that we would have had or could have obtained by paying premium prices, enough coal to have continued operations, had it not been for the Governor's order" (letter to the author dated Aug. 24, 1953). Special inquiry concerning positions of four large electric utilities indicate minor curtailment of service because of coal shortage at least in one case. "The electric service to only a few large industrial customers was curtailed to a very minor degree and for about a week in Feb 1950" (letter to author Aug. 20, 1953).

tioned omissions, this study has examined the impact which interruption in mining associated with labor disputes has had upon coal consumers over the period of two decades. Analysis of the monthly records for the entire period indicates no disturbance in consumption patterns for market-access consumers chargeable to coal mine labor disputes. This has been in part because the productive power of the bituminous coal industry has been great enough to permit reliance upon the anticipatory feature of the time-shift form of the offset factor. In part, however, it has also been due to the fact that most of the coal disputes have been synchronized with reductions in consumer requirements. Combination of these two elements insured the adequacy of compensatory reserves.

The case seems somewhat different for the steel mills, but the special character of their position does not become evident until after 1944. Prior to that year compensatory reserves were complete protection and reduced steel output could not properly be charged to lack of coal supplies. If one regards the level of current steel production for those specific major-dispute months after World War II as the critical test, there may have been cases of impaired coal consumption. Specifically they are those of April-May 1946, possibly those of March-April 1948, and more doubtfully those of September-October 1945.

However, the mere test of reduction in current steel output is insufficient. The extension of the theory of the offset factor to steel mills gives a more complete understanding of the actual impact of coal-mine labor disputes upon such consumers. A part of the compensatory reserves of such consumers is in the form of their own semifinished products. Moreover, by contributing to the creation of consumers' durable goods, they can transfer the retroactive feature of the time-shift offset factor in the coal mines to their own production. In its present form, this application of the theory of the offset factor to productive-use coal consumers cries out for further testing through a detailed examination of changes in durable goods inventories.

Although the applicability of the retroactive feature of the time-shift form of the offset factor to productive-use coal consumers is an important question, its significance in the coal disputes since World War II is limited to only a few cases. The largest reductions in steel output, also in consumption by coke ovens, have resulted from general recession forces or from labor disputes in the steel industry itself. The changes in coal consumption which occurred when there were coal mine stoppages appear as little more than mild monthly fluctuations which are only the vestigial remains of a seasonal pattern that has almost been "swallowed up" by the generally expanding output since the close of World War II.

Two main conclusions then emerge. First, compensatory reserves

have always been adequate to shelter market-access consumers. Second, even for the largest productive-use consumer such reserves have usually been adequate, but in special cases the application of the time-shift form of the offset factor furnishes rational support for the view that *total* coal consumption and therefore steel production has not been reduced.

The long route of this study has given no glimpse at the course of miners' wages. Neither has there been more than implied reference to the question of the relation of labor disputes to the price of coal and of substitute fuels. These are important parts of the economic problem of labor disputes in coal mines which require further study. But to have found the solution to one element of the problem, if indeed that has been done, has a value of its own. Moreover, it has the important collateral quality of sharpening the focus of the still unsolved elements. To use Emerson's words, "The field cannot be well seen from within the field. The astronomer must have his diameter of the earth's orbit as a base to find the parallax of any star."

SPATIAL AND LOCATIONAL ASPECTS OF METROPOLITAN LABOR MARKETS

By WILLIAM GOLDNER*

In the decade since the second world war, there has been increasing awareness of the complex internal structure of local labor markets. Stemming originally from attempts to reconcile wage theory concepts of equilibrium with empirical findings of wage rate diversity, the notion that "noncompeting" groups face barriers to employment other than the limits set by workers' occupations has been widely studied. The attempts to identify these submarkets within the over-all structure of the labor market have been partially successful. An extensive series of labor mobility studies has accumulated and in many of these analyses, empirical data support the hypothesis that immobilities have occupational, industrial, geographical, and other socio-economic bases.[1]

Although these findings pervade all studies, in most cases the link between the empirical results and wage theory has been far from explicit. In addition, much more attention has been paid to occupational, industrial, and interarea mobilities and immobilities than has been focused on intraarea spatial barriers. The internal geographical arrangements of the labor market complement and reinforce the occupational and industrial boundaries that have been found to exist in local labor markets. The primary purpose of this paper is to point out the significance and implications of this neglected source of labor immobility.

This paper serves a second purpose, and it comes as a joint product of the analysis, by defining in clear detail the nature of labor market boundaries. What are the outer limits of a labor market? How ex-

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[1] A partial list of these studies should include: C. A. Myers and W. R. Maclaurin, *The Movement of Factory Workers* (New York, 1943); L. G. Reynolds, *The Structure of Labor Markets* (New York, 1951); C. A. Myers and G. P. Schultz, *The Dynamics of a Labor Market* (New York, 1951); G. L. Palmer, *Labor Mobility in Six Cities* (New York, 1954); C. Kerr, "The Balkanization of Labor Markets," in E. W. Bakke and others, *Labor Mobility and Economic Opportunity* (New York, 1954), pp. 92-110.

tensive or how narrow are these limits in the spatial dimension? And who is responsible for their alignment?[2]

The general approach is as classical as supply and demand determining price. Generalizations which can be made about the spatial arrangements of business and commercial establishments provide the premises as to the basic locational pattern of demand for labor. Confronting these premises is another set gleaned from analysis of the spatial preferences of workingmen. The supply of labor is some function of these preferences. The reconciliation of these generalizations expresses itself in certain characteristics of the journey from home to work and results in a detailed hypothesis regarding submarkets and market boundaries.

Workers' locational preferences are not a unique and independent portion of the totality of the workers' labor-market preferences. A related set of propensities are those involving workers' choices between labor and leisure. Obviously, the patterns of locational preferences, involving the places at which the worker is willing to work, and how he gets there from his residence, also involve the time spent in the journey to work. The relation of work, commuting time, and leisure time, are therefore integrally related as elements determining the workers' preference patterns. In addition, the pervasive influence of occupational and industrial attachments in affecting and limiting the job choices that the worker is willing or able to make must be considered. The total of all factors which affects the workers' preferences in the labor market is an aggregate of many interdependent variables.

The problems of workers' locational preferences are not to be dismissed as being too complex for any logical summarization. Systematic and predictable aggregation of these preferences is evident in several empirical studies of the journey to work and these very studies are the stimulus for this elaborate hypothesis. It must also be made clear that this discussion does not involve what is commonly called geographical mobility, *i.e.*, the movement of manpower from one local labor market to another. It is primarily concerned with intramarket movement, particularly, the discernible patterns of that movement, and the consequences of these patterns to labor-market and wage-determination theory.

I. *The Model of the Urban Center*

The metropolis used as a model in this analysis is an abstraction, departing from reality in many ways. Yet, when we consider that there

[2] The empirical counterparts of these theoretical questions regarding labor market boundaries are raised in N. A. Tolles and R. L. Raimon, *Sources of Wage Information: Employer Associations* (Ithaca, 1952), pp. 289-90. The quotation from an anonymous employer association official on page 290 is a striking confirmation of the argument presented in this paper.

are underlying economic forces operating in allocating land uses, it is not surprising to find certain generally recurring elements in the spatial structure of a metropolitan area.

Actually, there are surprising regularities in the over-all layout of metropolitan communities; and observable patterns of urban growth are remarkably similar among most metropolitan centers. Metropolitan communities are usually found to have:[8]

1. *Central business districts,* in which specialized trade and service functions catering to metropolitan-wide markets are located. These functions usually are located at the focus of transportation facilities in order that access may be conveniently offered to the whole community.

2. *Light industrial and commercial districts,* near and surrounding the central business district. Warehouses, garages, manufacturers of style goods and products of small bulk are typical of this category. For industries in this category, such as clothing manufacturing and printing, labor is a more important localizing influence than raw materials. Therefore, these industries cluster near the focus of transportation and compete for space with the older residences near the core of the city, resulting in hybrid industrial-residential areas.

3. *Special industrial districts,* almost exclusively devoted to products of medium to large bulk, and therefore situated in close proximity to water, rail, or highway transportation facilities. These areas are the sectorizing influences that frequently are situated not too far from the central core of a community, customarily on the opposite side of the railroad terminals or waterfront from the central business district. Sometimes this area becomes an industrial enclave as community growth engulfs and surrounds the industrial district.

4. *Large primary processing plants,* also located along water frontage, railroad lines, and highways, but farther out along the transportation network. Oil refineries and steel mills are typical of this type of establishment, with requirements for a large volume of bulk movements, substantial quantities of skilled and unskilled labor, large areas for plant, and a buffer zone between plant and community to dissipate smoke, noxious odors, and noise.

5. *Large modern assembly-line factory areas,* also located on transportation facilities, and oriented to large tracts of flat land for single-story continuous-flow assembly operations. Examples are aircraft, auto-

[8] The classification which follows constitutes a regrouping and synthesis of the discussion in E. M. Hoover, *The Location of Economic Activity* (New York, 1948), pp. 116-41. See, in addition, D. J. Bogue, *Population Growth in Standard Metropolitan Areas, 1900-1950,* (Washington, 1953), pp. 18-19 and *passim,* and D. L. Foley, "Urban Daytime Population: A Field for Demographic-Ecological Analysis," *Social Forces,* May 1954, LII, 324-25, for well-documented insights into metropolitan locational patterns.

mobile, and electrical equipment industries. These large plants are the sparks igniting the nucleation of decentralized factory areas surrounded by residential suburbs.

6. *Convenience goods establishments and neighborhood shopping centers,* distributed at important intersections and along principal streets in all parts of the city approximately in proportion to sidewalk and vehicular traffic. Examples are food markets, variety stores, motion-picture theatres, eating places, pressing and cleaning shops.

7. *Residential areas* of several kinds. Near the central business district and competing for space with light industry is the decaying core of the older residential area. Land being valuable because of the competition of commercial uses, the high property valuations lead to use of old residences as multiple dwelling units, with low unit and high aggregate return. The modern residential sections are farther out, spaced between but not too close to commercial sectors that radiate out from the central district. The newest residential areas are on the periphery and also may be adjacent to or near large but clean industrial plants of the type described in 5.

This generalized ordering of urban spatial relationships suggests that there are systematic influences that affect labor supply and labor demand operating out of the identical forces that array the spatial relationships themselves. The particular spacing of establishments on the basis of the convenience of bulk transfer suggests that industries, another way of naming or specifying products or groups of products, are a particularly important differentiating factor on the labor-demand side. Similarly, the clustering of homogeneous types of residences in neighborhoods and districts of the metropolis suggests that certain systematic uniformities, such as those based on income, occupation, and perhaps industrial attachment, prevail on the labor-supply side of the market. A more detailed inspection of these grouping and associative tendencies follows.

II. *The Locational Aspects of Labor Supply in Metropolitan Labor Markets*

A summarizing concept which aids in describing the patterns of workers' locational preferences is the "normal preference area." The normal preference area of an individual wage earner is that geographical area within which he is willing to work at a particular point in time. This area is normal in the sense that it is associated with the worker's normal or regular occupation, compensated for at the normally prevailing or average rate of pay, and assumes the general level of economic activity is at some normative level. In abstracting from variations in pay level, in working conditions, in nonpecuniary job amenities,

and in other factors associated with workers' selections of jobs, the slighting of these items is not meant to diminish their importance. As has already been mentioned, workers' locational preferences are only a partial explanation of the whole complex of workers' preferences and the factors which have been discounted have their proper place in the constellation of preferences. Later, factors influencing the scope and extent of the normal preference area will be considered.

The normal preference area may have a circular shape, it may be elongated if, for example, the transportation network makes certain axes of the preference area equal in time rather than distance, or it may be highly irregular reflecting idiosyncracies of the worker, or irregularities in topography, or other frictions.

Some elemental characteristics of workers' locational preferences can be seen in a highly abstract model. Let us assume completely undifferentiated units of manpower, each carrying with itself the appropriate mixture of capital and other inputs necessary to produce a unit of homogeneous output. Assume further that these units of labor are spread with equal density throughout a circular urbanized area. In this highly simplified situation, which is intended to abstract from the journey to work, work places and residences are uniformily spread throughout the labor market in the most unspecialized form, and no rational locational preferences may be said to exist. Each worker can produce the economic product where he is situated.

Let us now drop the assumption of occupational homogeneity, but still posit that work places are distributed equally throughout the area. Under this set of assumptions, small teams of complementary occupations would have to form to produce the homogeneous product, their work places very close to their residences. Residential districts would be occupationally heterogeneous, and by assumption, commercial and business establishments would show no tendency to cluster. The teams of manpower that cluster together for production purposes would have to be larger, the greater the degree of occupational specialization. Also, the larger these teams, the larger the average distance to work from the equally dense residences to the equally spaced work places.

Let us now enlarge the size of the team at each work place and see what happens. If the degree of occupational specialization is such that teams must have 25 workers to be complete, then perhaps all the workers on both sides of a city block would have to assemble in the middle of the block to carry on their production. If 250 workers are required, then workers would have to assemble at a central work place from all of the residences in perhaps four square blocks. And if 2,500 workers were required the area from which they would have to come might cover a square mile. We must recall that work places of the

same size are springing up throughout the area but it has been postulated that they are equally spaced and of the same degree of desirability, so that there are no rational alternatives. As the sizes of work places are increased, the average length of journey to work increases, and somewhere in this process, first one and then cumulatively more workers will find the progressively longer journey to work burdensome. The points at which these crystallizations of dissatisfaction take place define the boundaries of the particular worker's normal preference area.

Before we return to the concrete generalizations of metropolitan locational structure which were previously discussed, it is necessary to work out one more concept, the aggregation of normal preference areas. Chart 1 will be helpful in clarifying the aggregation procedure.

Workers in a metropolis have normal preference areas like those outlined in Chart 1.1. Because of the heterogeneity of preferences there would be much overlapping. This can be seen along a specific axis *aa* as shown in Chart 1.2. Not all points on axis *aa* fall within the preference areas of the four workers on the map, and each of the workers is available only along a short range of *aa*. The aggregate number of workers available at points along *aa* can be determined by summing the individual preference ranges along *aa* as shown in the preference profile in Chart 1.3. The four workers are available only for a short range *rr'* on the axis *aa*. Less than four workers are available as we move toward the extremes of the axis. These preference profiles are perfectly generalizable because the line *aa* can be drawn through the mass of preference areas in any direction and through any selected point.[4]

Now that the mechanics of aggregation have been explained, let us turn to the simplified models which we have previously discussed in order to determine the typical cross-section patterns. If individual preference areas vary unsystematically throughout, say, a circular urban area and occupational differentiation does not exist, then the aggregation of preference areas would result in a virtually flat preference profile along any axis of the area, with the frequencies declining at the periphery. The edge of the labor market defined in terms of workers' preference areas would be beyond the perimeter of residences out to the limits of the outermost worker's preference area. It is noteworthy that this boundary would be at the end of a gradient, *i.e.*, there would be decreasing frequencies of workers available as we move out from the area-wide flat plateau of aggregated preference areas to the edge of the outermost preference area. The boundary of the labor market

[4] The gradient pattern of the preference profile has been confirmed in empirical work by J. D. Carroll, Jr., "The Relation of Homes to Work Places and the Spatial Patterns of Cities," *Social Forces*, March 1952, XXX, 276; and L. F. Schnore, "The Separation of Home and Work: A Problem for Human Ecology," *Social Forces*, May 1954, XXXII, 338.

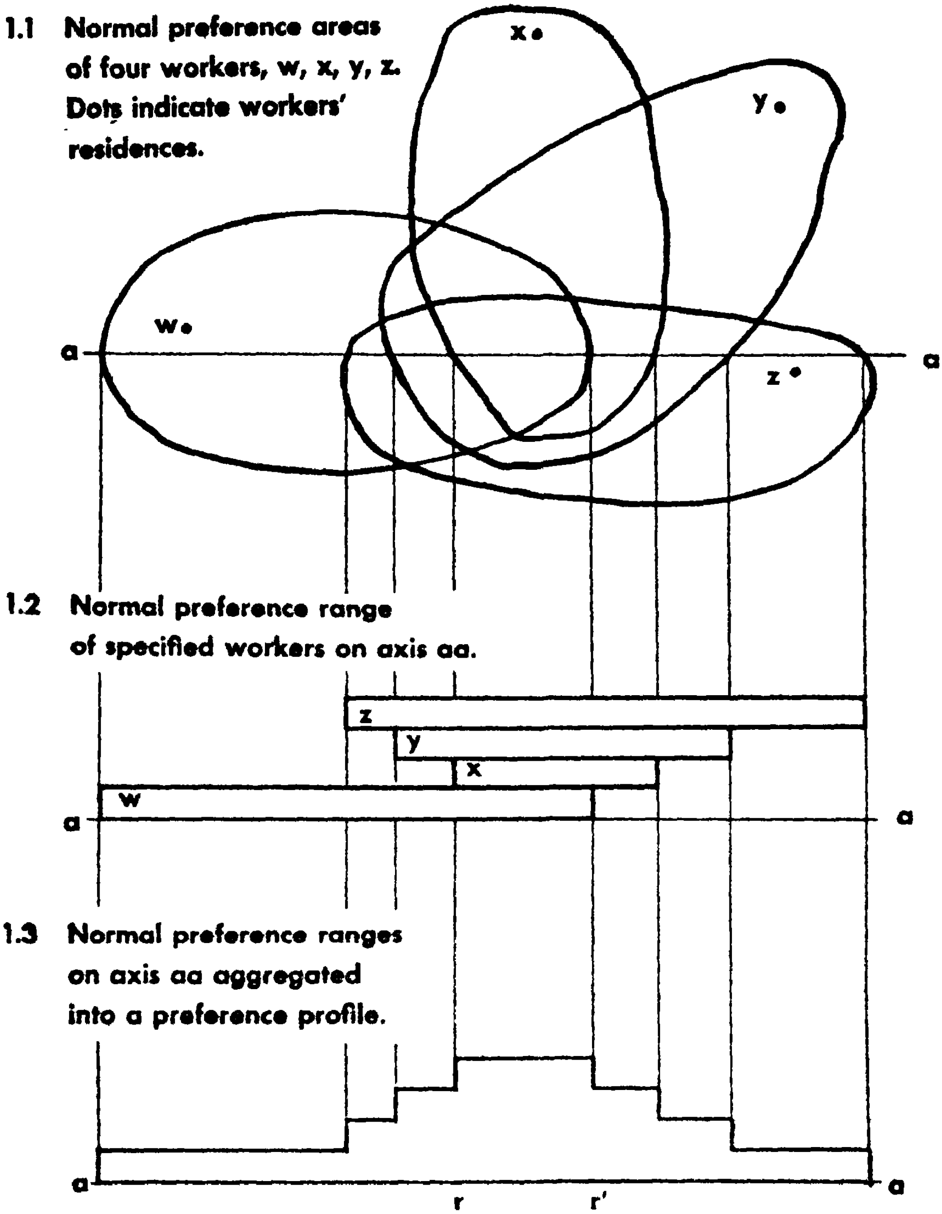


CHART 1. AGGREGATION OF WORKERS' LOCATIONAL PREFERENCE AREAS

is therefore a function of workers' locational preferences—of how far they are willing to go—in addition to the physical limits of the urban area.

If we drop the assumption of occupational homogeneity, but assume that each occupational skill is scattered randomly throughout the area,

then the preference profiles would still be flat across the whole of the area, with a tapering gradient at the boundaries. This is true by simple addition, for we could treat each occupation as a homogeneous factor, with results already described. The addition of flat frequencies across the whole area would result in a flat aggregate. In this model, a work place would have available to it a number of workers, occupationally diversified, equal to the cumulative frequency of the normal preference areas that have in common the point where the work place is located. A preference profile along any axis passing through the work place location would measure the number of workers on which that establishment could draw. And if all work places were the same size and equally spaced, the whole labor supply could work without any wage-earner working outside his normal preference area. Spacing and size of firms would be a function of the density of workers' residences and the randomness of workers' locational preferences.

Let us define locational compatibility as that situation in which the aggregation of manpower demanded by the firms in the labor market does not exceed the market preference profile at any point. If we may change the object of the traditional game of the county fair gambler, we are seeking the largest pea that will fit snugly under the walnut shell. Such a labor market under our previous assumptions, would consist of a galaxy of establishments of equal size, spaced equally throughout the area, each plant drawing upon the nearby labor supply to the extent that no worker has to go beyond his normal preference area. The size of each firm, and of all firms under our assumptions, could increase up to that point where one or more workers would have to be drawn beyond his normal preference area. In this highly artificial situation, the maximum size of firm is subject to the restriction imposed by workers' locational preferences.

The locational compatability which has just been described is in no sense a self-adjusting equilibrium toward which all establishment sizes must adjust. It merely defines the degree of adjustment of the aggregate workers' preferences on the supply side of the labor market with the aggregation of employment opportunities on the demand side. Work places may be smaller in size and therefore not test the limits of the workers' preference areas, or they may be very large and require at least some workers to work beyond their normal preference areas. Although the availability of labor does affect the size of establishments and shortages of labor may constitute a restraint on establishment size, other determinants of the size of firm are equally or more important. Factors influencing the size of firm are therefore considered to be exogenous to this model.

III. *Factors Associated with the Scope and Extent of the Normal Preference Area*

So far we have assumed that normal preference areas, although not necessarily uniform, varied in no systematic way, so that in aggregating them, a uniform frequency of workers was available at all points in the urban area. We will now introduce some variants which logically qualify this assumption.

Normal preference areas conveniently reflect several labor force participation concepts, and therefore make it possible to assimilate into our model important features of labor force dynamics. For instance, the entry into the labor market of a person who has heretofore been outside the market is reflected in an additional normal preference area being included in the market aggregate. In like fashion, workers who traditionally enter the market during particular times of the year for seasonal work may project very narrow preference boundaries during the off season, a situation reflecting the fact that they would take a job then only under special locational conditions.

Cyclical fluctuations of the economy likewise reflect themselves in the expansion and contraction of the normal preference areas. Normal (as distinguished from supernormal) full employment peaks are reflected by smaller preference areas in two ways. First, the greater availability of job opportunities is matched by the individual worker's increased expectation of finding one among the many available nearer his home. Second, the expansion of particular industries generates higher wage levels in these industries, and the coexistence of abundant job opportunities and a higher pay scale may induce workers to extend their job horizon only slightly or not at all beyond their normal preference areas. For normal pay levels, the preference area must therefore be smaller. The inverse of these two conditions during periods of unemployment leads to more extensive preference areas.

Differences in the scope of normal preference areas probably exist between men and women workers, and between workers of different ages. Persons who are employed probably have narrower normal preference areas than those seeking work.

One important factor upon which there is empirical information, although only of fragmentary and suggestive kind, is the locational effect of occupation. A study of the journey to work, made in Chicago, shows that "the degree of work-residence separation increases as the level of occupation rises. . ."[5] Current weekly earnings, a variable that is highly

[5] Chicago Community Survey, "Degree of Work-Residence Separation for Wage and Salary Workers: Chicago, 1950-1951," Urban Analysis Report Number 17 (Chicago, 1953), p. 7.

correlated with occupation, shows a similar relationship, being associated positively with the distance from home to work.[6] A similar conclusion regarding the relationship between occupational level and the distance from home to work can be arrived at, for cruder occupational groups, from a study of Los Angeles.[7]

These findings suggest that workers' normal preference areas increase in scope as they move up the scale of occupations. Babysitters seek their jobs in the neighborhoods near their homes. Unskilled workers, being unspecialized, are more likely to encounter an acceptable job nearer to where they live. Skilled workers have to work for employers using their specialized skills among a far-flung group of establishments. Atomic physicists generally do not have cyclotrons near their houses although it is possible that they can better afford to move to or near their work locations.

The influence of methods of transportation on the scope and extent of normal preference areas also must be considered. The journey to work is compounded of factors integrating time, distance, transportation costs, and convenience into a complex set of disutilities. Fast, convenient, inexpensive public transportation is conducive to more extensive preference areas. If the transportation network is slow or uncomfortable, the preference areas may contract. Furthermore, if there are places out of contact with the means of transportation, dead spots within the normal preference area may arise. Most important are changing fashions in means of transportation, particularly with regard to the automobile.[8] Increasing proportions of the work-force are using individual cars to drive to work. This provides much greater variability of work-residence transport routes, and also may be faster and more convenient, although it may not be cheaper. Certainly, the use of the automobile is the culmination of a trend which has been operating for at least a half century toward faster, more flexible, more variable, more comfortable transportation between home and work. The concomitant result for our analysis is a secular broadening of many normal preference areas.

Finally, and perhaps most important, is the influence of union rules on normal preference areas. Union rules may affect the worker's normal preference area directly or indirectly.[9] Although there are varia-

[6] *Ibid.*, p. 10.

[7] E. Shevky and M. Williams, *The Social Areas of Los Angeles* (Berkeley, 1949), 172 pp. A simultaneous scanning of Fig. 9, facing page 36, which shows the locations of industrial and residential districts in Los Angeles and Fig. 11, facing page 40, which shows the predominant occupational group in each census tract, provides a striking reinforcement of the relationships mentioned here.

[8] Bogue, *op. cit.*, p. 18.

[9] The complexities of this problem of institutional influences on the boundaries of labor markets and submarkets is authoritatively discussed in Kerr, *op. cit.*

tions and complexities, craft unions, particularly those of the building trades, foster a uniformity among preference areas for all who are admitted to membership. In some cases, this may be accomplished by making membership more difficult to achieve for workers from outside a specified city or county or district. Sometimes, the normal preference area is formalized by the provision for premium pay for work outside a specified geographical area such as a city or county or an area over which the union has exclusive jurisdiction. But it is logical to assume that the satisfaction of preference for the craft union member is taken into consideration in the setting of the union wage rate. Not many or any union members will find their normal locational preferences in conflict with the bargained wage level.

In addition to the systematic influences on normal preference areas from labor-force participation, seasonal and cyclical factors, occupations, methods of transportation, and union rules, there are the non-normative influences on the normal preference area. A worker will extend the boundaries of his preference area if the pay is exceptionally favorable, or if the occupation has high status, opportunities for advancement, or other special attractions. The exigencies of wartime and the pressures stemming from that abnormal psychological environment may also lead to broadening of preference areas without regard for the influences normally resulting from full employment which have been described above. But, in the main, and particularly for industrial wage earners, the normal preference area is fairly invariable for a worker who has mastered a particular set of occupational characteristics for which he has an expectation regarding the appropriate rate of pay, during a period of economic stability.

IV. *Locational Incompatibility in the Labor Market*

We are now ready to examine the pattern which results from the weaving together of the threads of the preceding argument. From the abstract and summarized description of an urban center, we will try to generalize the contours which reflect the spatial pattern of aggregate demand for labor. From the patterns of residences are obtained summarizing premises regarding the home location of the labor supply, and from the theorizing about normal preference areas is obtained the logic of their interrelationship.

In trying to summarize the spatial organization of labor demand, it is fortunate that we are not confronted with the preference areas of particular firms. The location of the firm's labor demand is at the factory entrance and, therefore, the locational distribution of commercial and industrial establishments defines the spatial pattern of labor demand. By analogue to our preference profiles, we can form the

shape and cross-sections of labor demand along specified axes. Across the whole area of the city are neighborhood clusters of decentralized special-service areas. This layer of labor demand is roughly proportional to the neighborhood volume of local traffic.

Along the main thoroughfares, arteries, highways, and railway lines pointing toward the core of the city are strings of business firms, which, superimposed upon the nearly flat shape of the aggregate demand from decentralized services, create ridges of demand, like the arms of a starfish, in some radial arrangement. As we approach the core of the city, the increasing number of light industries raises the demand contours, and when we incorporate the extraordinarily high concentration of business firms in the central business district, we have a demand mound.[10] The mound has a marked peak at the central business district, surrounded by the declining demand profile of the central business district periphery, and finally branching out into several radial arms, all superimposed on a roughly flat (if anything, it would tend to peak at the center, too) base of generalized neighborhood labor demand.

We also have to incorporate into this structure those special decentralized nuclei of large plants or clusters of plants on the radial arms or near them, which would reflect themselves on the demand mound as subpeaks of demand.

Piecing together the elements of the labor supply mound constitutes a difficult but not insuperable problem. Keeping in mind that the preference areas of low-skill workers are not as extensive as those of higher skills, we find that the lower skills are also concentrated closer to the center of the urban area than are the higher skills. The combined effect of these factors creates a peak at and near the central business district and a fairly sharp decline in the preference profiles as we go toward the area perimeter. Those occupations which reside near the periphery of the area being of higher skills have wider preference areas, extending all the way across the central district and perhaps across to the other side of the city. But the clustering effect of narrow preference areas among workers of low skill, and the concentration of these workers in older residential districts nearer to the center of town creates a peak in the labor supply at the central area with diminishing availability as we go toward the outskirts of the community. If the business and commercial radials are also bordered by workers' residential districts, then the aggregate supply mound will have rounded branches radiating from the center.

In a compactly distributed city of small or medium size, it is probable that the aggregate of employments can be filled without violating the boundaries of workers' normal preference areas. Individual firms will

[10] Specific data suggestive of this concept are graphed in Carroll, *op. cit.*, p. 276.

fill their labor requirements with those workers who find the firm within their normal preference areas. The nonnormative influences mentioned at the end of Section III above will not have to be brought to bear in order to effect fairly rational adjustments between the locations of the labor supply and the labor demands. The problems of labor recruitment for plant personnel offices in such communities will not be particularly difficult to solve.

For larger and more sprawling urban communities, the residential concentration of low skills generates abundance of supply in some locations and deficiency of supply in other places, when consideration is given to locational preferences.[11] The deficiencies of labor supply can most clearly be visualized at the central business district and, in some cases, at the periphery of the metropolis. The deficiency in the downtown center is the result of the extreme concentration of metropolitan services with their large and intensified demand for labor measured against a labor supply curtailed by the workers' locational preferences for jobs farther out from the center of the city. On the outskirts of the metropolis, individual plants and business centers may mushroom in size, exerting a need for manpower that exceeds the thinly distributed labor supply nearby. Furthermore, the peripheral locations of the plants may lie beyond the bulk of the preference-area boundaries of workers who live closer to the center of the community.

Abundance of labor may occur in areas surrounding the central business district and along the industrial and commercial radials leading out of the city's center, primarily because of the concentration of workers' residential quarters in the less expensive and often decaying areas immediately adjoining the industrial districts and commercial sectors.

The problem of plant labor-force recruitment under these varied conditions becomes more difficult, and intensive efforts to attract workers might have to be made. The increasing distances created by the enlargement of the city, and the necessity of large plants to tap ever-widening sources of labor supply are two variables which run counter to workers' locational preferences. Thus, plant size and city size are the primary determinants of locational incompatability.

V. *Implications*

The consequences of the lack of compatability between labor supply and labor demand, when the workers' locational preferences are con-

[11] Although his analysis does not incorporate the concept of normal preference areas, the excess of jobs at the central core of the community is observed by Carroll, *op. cit.*, p 280, as follows: "Job density . . . will be expected to show a . . . declining density with distance from the center. However, we may expect greater central concentration and a more rapid decline in density than in the case of residential distribution."

sidered, are several. The key factors operating in those situations in which workers' locational preferences tend to be incompatible are large plants and large-size urban centers. To adapt to this incompatability, higher plant wage levels act to broaden the workers' preference area and therefore draw workers beyond the limits of their normal locational preferences. In theoretical terms, this means that labor supply curves to firms subject to locational disequilibrium would be relatively less elastic beyond a certain point. Small and medium-size communities with compatible distributions of industrial and commercial establishments of moderate size may operate within the limits of the locational compatability which has been described, and no pressures (via wage differentials) to force the broadening of workers' normal preference areas may exist. Such communities may have relatively little wage dispersion for given skills and the aggregate wage level would not be subject to the special influences stemming from locational incompatabilities.

Large plants in small or medium-size communities may or may not create locational incompatability depending on the plants' specific locations and the relationship of plant size to the available area labor force. Dispersion of wage rates may therefore be large or small, and wage levels might be normal or higher than normal. In communities of sizes small enough that every worker's preference area covers the whole business area, and this may very well be true for compactly spaced communities of up to 200,000 population, locational preferences probably do not effectively operate to influence the labor supply curve to the firm.[12]

The conjuncture of large metropolitan centers and plants of different sizes leads to several interesting alternatives. Plants of small or medium size are in a preferred position when they are in clusters small enough not to tax the limits of the workers' preference areas that touch upon their industrial sites. It is not uncommon to find wage levels tapering off toward the outskirts of a large urban center under such circumstances. But larger decentralized clusters of small and medium-sized plants may create points of locational incompatability and employers in those plants also may have to take measures to draw workers beyond the limits of normal preference areas. Small or medium-size plants in or near the central business district are part of the aggregate labor demand of the downtown area and mav pay equivalent area wage scales, or pay slightly lower scales if differentials in worker efficiency are acceptable.

Large plants in metropolitan centers almost certainly tax the limits of the available supply of labor, taking into consideration preference areas. If these plants locate on the outskirts, their labor requirements

[12] *Cf.*, Reynolds, *op. cit.*, pp. 41-42 and 227-28.

will in most instances exceed the available work-force, and if these firms add their needs to the cumulative requirements already existent in or near the central business district, they will contribute to the already existing locational incompatability. Thus, in large metropolitan centers, wage dispersion will be greater, and average wage levels higher because of the operation of workers' locational preferences.

This analysis has applicability for industries, too, for it suggests that industries characterized by large plants may have higher average industry wage rates. The fact that the occupational wage rates in manufacturing exceed those of all other industry divisions, with the possible exception of public utilities, seems to be consistent with the significance of the establishment-size variable in this analysis.

A second set of implications from this analysis relates to the spatial limits of the labor market. As was described in Section II, the aggregation of workers' preference areas results in a mound which tapers off beyond the boundary of the urban area. The limits of the labor market are therefore not physical, but rather are established by the value judgments of workers. Similarly, influences which expand or contract the bounds of the workers' preference areas affect the labor market boundaries. Finally, it is likely that some normal preference areas cover every habitable area, meaning that the real limit—the point beyond which no labor is willing to go—does not exist. Labor market boundaries are therefore arbitrary, flexible, and shift with time and economic circumstance. Conceivably, there even may be normal preference areas of rural workers that overlap into the urban area. These preference areas may be of a completely different size and type from those which have been described here, but their existence also impinges on any fixed and rigid concept of labor-market boundaries.

In empirical terms the external limits of the labor market should be conceived as existing well beyond the built-up area of the city, of being subject to changing influences in time, of differing among occupational-skill levels, and of being arbitrarily determined in the sense that a few workers' preference areas will exist at and extend beyond the arbitrarily established limit.

A third consideration that stems from this analysis is that a simple count of the labor force in the whole of an arbitrarily defined labor market may be extremely misleading with regard to labor availability. This will be particularly true in large metropolitan centers, or where large plants abound. Thus, the classically deduced cautions against simple aggregation of labor demand schedules[13] must be augmented by similar warnings regarding the aggregation of labor supply.

[13] A. C. Pigou, *The Theory of Unemployment* (London, 1933), pp. 61-76; and A. C. Pigou, *Lapses from Full Employment* (London, 1945), pp. 38-56.

Fourth, the fact that normal preference areas (and other manifestations of workers' preferences) vary with occupation, merits some further examination. Most important, these findings have significant implications for wage differentials between skilled and unskilled workers. May it not be that American skill differentials, which are much wider than comparable European counterparts, reflect the peculiarly American dependence on the automobile, on the privately owned individual dwelling, and on the differing scope and extent of workers' normal preference areas. North European cities have much more mass housing and many multi-unit residences, frequently concentrated in workers' districts. In addition, the automobile has no place in the European factory worker's budget. An empirical investigation of European metropolitan patterns of workers' locational preferences might start with the hypothesis that these patterns are more uniform than their counterparts in the United States.

Finally, the pattern of workers' locational preferences offers significant implications for the organization of employment service offices. Choosing among the alternatives of establishing placement offices on an industry, occupational, or general job coverage basis is an important organizational problem. If placement offices accepted the objective of facilitating contact by job-seekers, then the offices might properly be located in or near the residential sections of the metropolitan area. The clustering tendencies of workers in residential districts would automatically provide a locational basis for occupational specialization and at the same time facilitate the mass servicing of those seeking employment. Whether these advantages outweigh other considerations in locating employment offices is beyond the scope of this paper.

ORGANIZATIONAL STRUCTURE AND PRICING BEHAVIOR IN AN OLIGOPOLISTIC MARKET

By R. M. CYERT AND J. G. MARCH*

One of the most common propositions in the literature of organization theory is that a change in organizational structure results in a change in operative organization goals.[1] To the extent that this is true, it should be possible to develop a model that specifies a meaningful relationship between significant characteristics of organizational structure and some important attributes of organizational behavior.[2]

The theory of price determination in an oligopolistic market situation is generally unsatisfactory to economists.[3] Typically, neither the level of price nor price changes can be explained. The tendency of oligopolistic firms to change price relatively infrequently in comparison with firms in competitive markets has frequently been noted.[4] While it is not maintained here that organization theory can provide the whole, or even the major answer, it is the purpose of this paper to indicate some of the ways in which such theory can be brought to bear on the problem of the price behavior of a firm in an oligopoly market.

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[1] See, for example, E. Dale, *Planning and Developing the Company Organization Structure*, A M.A. Research Report No. 20 (New York, 1952), pp. 23-38; H. A Simon, D. W. Smithburg, V. A. Thompson, *Public Administration* (New York, 1950), pp. 136, 168-172. For a study of a specific example, see H. A Simon, "Birth of an Organization: The Economic Cooperation Administration," *Pub. Admin. Rev.*, Autumn 1953, XIII, 227-36.

[2] For a general discussion of the application of organizational theory to the economic theory of the firm, see A. G. Papandreou, "Some Basic Problems in the Theory of the Firm," in B. F. Haley, ed , *A Survey of Contemporary Economics*, Vol. 2 (Homewood, Illinois, 1952). The present paper may be viewed as an attempt to meet the comments of E. S Mason, *ibid*, pp. 221-22, with reference to the need for specific theoretical examples of how the addition of organization theory variables contributes to the explanation of firm behavior.

[3] See K N. Rothschild, "Price Theory and Oligopoly," *Econ. Jour.*, Sept. 1947, LVII, 299-320

[4] P. Sweezy, "Demand under Conditions of Oligopoly," *Jour. Pol. Econ.*, Aug. 1939, XLVII, 568-73. See also, G. J Stigler, "The Kinky Oligopoly Demand Curve and Rigid Prices," *Jour. Pol. Econ.*, Oct. 1947, LV, 432-49.

Since "organizational structure" and "price behavior" are ambiguous terms, they are defined in Section I. In addition, the development of the model requires the specification of a series of functional relations between organizational features and pricing behavior. This is done in Section II. In Section III, an example of two ideal-type organization models, which under our hypotheses will exhibit distinctively different price behavior, is presented, and the implications of the paper are illustrated by an application to a classical problem in economic theory. Finally, in Section IV, a program for empirical analysis is indicated.

I. *Definition of Variables*

The approach taken here should not be viewed as challenging the basic variables that have been treated as price determinants in economic theory. For firms operating in a perfectly competitive market, for example, nothing discussed in this paper has much relevance. The position taken is that the firm's perception of the market and the firm's perception of its capabilities for action are both affected by its own organizational structure. Given significantly different organizational structures, two firms facing the same external market and using the same set of variables in decision-making will exhibit substantial differences in price behavior.

Price behavior is defined in terms of three characteristics: (1) Frequency of price change is measured as the number of changes per time unit.[5] (2) Magnitude of price change is measured for any given change by the ratio of the amount of change (*i.e.*, the absolute difference between the old and the new prices) to the old price. (3) Direction of price change can be positive or negative, measured with respect to the last previous price.

Organization structure is defined in terms of two characteristics:

1. The communication pattern of the organization. Pricing decisions are assumed to be based upon expectations concerning future sales, costs, and competitors' behavior. One of the functions of the organization of the firm is to provide information upon which such expectations can be based, and the design of informational channels by means of which such information reaches the decision-makers comprises the communication pattern of the firm.[6]

[5] In the present analysis, the primary interest is in the organizational effect on price behavior of firms operating in the same market. The restriction to firms operating in the same market is made in order to hold constant the restraints imposed by market forces upon the frequency of price changes. Since the stringency of such restraints varies from one market to another, a comparison across markets of the organizational effect upon frequency of price change could not be made without the introduction of some concept of "opportunities for change."

[6] Obviously, the relevant communication channels are those actually in use—not neces-

Primary interest is in the relay points in a communication chain. A relay point is a "message center" which receives, decodes, encodes, and then retransmits an item of information.[7] Relay points can be distinguished by the number of major variables (*e.g.*, cost) about which they transmit information. This distinction is hypothesized to have important consequences for the amount of bias introduced at a particular relay point. Bias is defined to occur if any information is eliminated, modified, or added before a message is retransmitted. The character of control over a relay point is hypothesized to be decisive for the direction of the bias introduced, as is indicated more explicitly below.

The communication pattern of the organization is described by the nature of four different communication chains within the organization: the communication chains for demand information, for cost information, for information on competitors' behavior, and for information on firm policy. The nature of a given communication chain is determined by (a) the number of relay points in the chain, (b) their character, and (c) their order. The number of relay points in a communication chain is represented by a nonnegative integer. The character of a relay point is determined by the type of information transmitted through it. If a relay point transmits only one type of information, it is defined to have the characteristic of that information. If information relating to more than one variable is transmitted by a relay point, the character of the relay point is determined by the relative frequency over time of incoming communications concerning the different variables. Thus, if most of the messages received relate to cost information, the relay point is considered to be a "cost" relay. The ordering of relay points is specified to distinguish, for example, a communication chain for competitors' behavior in which information on competitors passes through a "demand" relay point and subsequently through a "cost" relay prior to reaching the decision-making unit from a similar chain in which the ordering of "cost" and "demand" relay points is reversed.

2. The size of the decision-making unit in the organization is measured by the number of individuals in the decision-making unit for each of whom it is correct to say that there is no more influential person in the unit. Thus, if the decision-making unit for a pricing decision is a committee of four in which two committee members are dominant over

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sarily simply those specified by formal organization rules. There is no reason to believe that such insistence creates insuperable observational difficulties. See K. Davis, "A Method of Studying Communication Patterns in Organizations," *Pers. Psychol.*, Autumn 1953, VI, 301-12; A. H. Rubenstein, "Problems in the Measurement of Interpersonal Communication in an Ongoing Situation," *Sociometry*, Feb. 1953, XVI, 78-100.

[7] See C. E. Shannon, *The Mathematical Theory of Communication* (Urbana, 1949).

the other two but equal in power with respect to each other, the size of the decision-making unit is 2. The problem of identifying the distinguishing power differentials within the formal decision-making unit is susceptible to solution by the application of social-psychological techniques of influence measurement to the decision-making activities of the unit under investigation.[8] For example, one method for defining power relations that has been used successfully consists in an analysis of the remarks made during decision-making conferences.[9] The variable, therefore, is operationally defined although one should not expect the analysis in any given case to be simple. Under certain conditions, distinctive pricing consequences are seen as arising from critical differences in the size of the decision-making unit. These hypotheses are found below.

II. *Functional Relations*

Demand, cost, and competitors' behavior have been the standard variables of most oligopoly models since Cournot. This paper makes no attempt to deviate from that tradition. On the contrary, the goal is to augment oligopoly theory by introducing into it some fundamental propositions of the theory of organizational behavior. Two modifications of traditional oligopoly models are suggested by such theory.The first is recognition of the fact that the values of the relevant variables actually used within the firm for establishing price are functions both of data drawn from the real world and of the organizational structure through which those data are transmitted to the decision-making unit; the second is similar recognition of the fact that the method by which perceived information on the relevant variables is translated into pricing decisions is a function of the decision-making unit's perception of, and adherence to, official firm policy.

Official firm policy, in the sense in which it is used here, consists in a specific set of constraints placed by the holders of legitimate authority in the firm upon the pursuit of organizational goals by their subordinates. A series of hypotheses with respect to the relative dependence of a pricing decision upon official firm policy, given the size of the decision-making unit, is made. The mechanisms involved are also specified.

1. Decisions by a group will, in general, be more dependent upon firm policy than will decisions by an individual. The proposition is deduced

[8] For some examples of influence measures, see C. I. Hovland, I. L. Janis, H. H. Kelley, *Communication and Persuasion* (New Haven, 1953); R. Lippitt, N. Polansky, S. Rosen, "The Dynamics of Power," *Human Rel.*, Feb. 1952, V, 37-64.

[9] J. G. March, "Husband-Wife Interaction over Political Issues," *Pub. Opinion Quart.*, Winter, 1953-4, XVII, 461-70; T. M. Mills, "Power Relations in Three-Person Groups," *Am. Soc. Rev.*, Aug. 1953, XVIII, 351-57; F. L. Strodtbeck, "Husband-Wife Interaction over Revealed Differences," *Am. Soc. Rev.*, Aug. 1951, XVI, 468-73.

from the theory of group norms and reference-group behavior.[10] There is a reasonable amount of evidence to support the prediction that an individual with an attitude at variance with his perception of the group's attitude will tend (according to the relevance of the group for the satisfaction of individual goals) to adjust his "public" position to conform to the position he expects the group to take.[11] Such behavior may be exhibited even in the limiting case where all members hold a position at variance with their common perceptions of the group standard.[12] Thus, even if every member of the decision-making group is "cost-minded," if each believes all of the others to be "sales-minded," the decision will tend to be a sales-minded one. Since in the absence of contradictory evidence, each member of the group can be assumed to believe all other members of the group to be in agreement with firm policy, the operation of group norms serves to enforce conformity to that policy.

From this it should be clear that when a relationship is predicted between the size of the decision-making unit and the extent to which decisions will be independent of official firm policy, the assumption is made that reference groups (*e.g.*, Board of Directors, professional associations) other than the pricing unit itself can be ignored. Such an assumption is based on a prediction that all decision-making units, whether composed of an individual or a group, will be subject to the same outside pressures; but only the members of a group unit will have the additional pressure of internal group norms.[13]

2. If a decision contrary to firm policy is reached by a decision-making unit, it will be more stable if made by a group than if made by an individual. This follows from the premises of the preceding hy-

[10] A reference group for a given individual consists in those other individuals with whom he perceives himself sharing common evaluative criteria for judging an attitudinal position. The literature on reference-group theory is fairly extensive For example, see T. M. Newcomb, *Social Psychology* (New York, 1950), Ch 14, pp. 220-32; R. K. Merton and A. S. Kitt, "Contributions to the Theory of Reference Group Behavior" in Merton and P. F. Lazarsfeld, eds, *Continuities in Social Research, Studies in the Scope and Method of "The American Soldier"* (Glencoe, 1950). The theory of group norms is less well developed. See S. A. Stouffer, "An Analysis of Conflicting Social Norms," *Am. Soc. Rev.*, Dec. 1949, XIV, 707-17; J. G. March, "Group Norms and the Active Minority," *Am. Soc. Rev.*, Dec. 1954, XIX, No. 6.

[11] For example, see R. L. Gorden, "Interaction Between Attitude and the Definition of the Situation in the Expression of Opinion," *Am Soc. Rev.*, Feb. 1952, XVII, 50-58; M. Sherif, "A Study of Some Social Factors in Perception," *Archiv. Psychol.* (1935), No. 187.

[12] On this point, see H A. Simon, "Notes on the Observation and Measurement of Political Power," *Jour. Pol.*, Nov. 1953, XV, 500-516, esp. 510-11.

[13] Otherwise, it might be argued that where a pricing decision is made by a single individual, he will act with the originators of firm policy as a referent, and that, therefore, the test of the mechanism posited here would be vitiated by this restraint upon his "independence."

pothesis. A group provides the individual with a defense against outside pressures and simultaneously exerts a pressure toward intragroup conformity upon him.[14] The group will ordinarily be less effective in enforcing a "revolutionary" decision than in enforcing an "ideologically sound" decision. This stems from the prediction that the latter type of decision will ordinarily create fewer cross-pressures than the former.[15]

With respect to the communication-structure variable, two hypotheses of perceptual bias are made:

1. As the length of the communication chain is increased, factors are introduced that have the effect of inhibiting change. The temporal bias introduced by the change in conditions during the interval from the original transmission of the information to its final receipt by the decision-making unit is represented as a function of the number of relay points through which the information must pass. Clearly, this is only an approximation. The significance of variations in transmission speed among the relay points (*e.g.*, cost data travels more rapidly through cost channels than through demand channels) is neither denied nor introduced into the system, except implicitly in the statement of the second bias below.

The consequences of the temporal bias for the frequency of price adjustments stem both from the fact that one never "catches up" with current information and also from the attempts of members of the organization to adjust for the bias by means of forecasts (*e.g.*, "What will the situation be by the time this information reaches the decision-maker?"). It is hypothesized that both major consequences of the time-lag in communication serve to introduce into the premises of the pricing decision a bias against change. Note that this bias operates not only in the communication of, for example, cost information upward but also in the communication of firm-policy information downward.

2. The character of the communication chain introduces a bias into the information transmitted to the decision-making unit. The form of the bias is a tendency for a relay point to de-emphasize information inconsistent with the information with which it is primarily concerned. For example, let us make the assumption that the size of the market is consistently overestimated by sales departments and costs are consistently overestimated by accounting departments.[16] Let us further

[14] For a general introduction to the study of group pressures, see L. Festinger, S. Schachter, K. Back, *Social Pressures in Informal Groups* (New York, 1950); D. Cartwright and A. Zander, *Group Dynamics: Research and Theory* (Evanston, 1953), Part 3.

[15] For discussions of the consequences of cross-pressures, see L. M. Killian, "The Significance of Multiple-Group Membership in Disaster," *Am. Jour. Soc.*, Jan. 1952, LVII, 309-14; L. Festinger, "The Role of Group Belongingness in a Voting Situation," *Human Rel.*, Nov. 1947, I, 154-80; A. H. Leighton, *The Governing of Men* (Princeton, 1945).

[16] See C. C. Saxton, *The Economics of Price Determination* (London, 1942), p. 148.

assume that overestimation of demand results in an aggressive price policy (*i.e.*, frequent price changes, price-leadership), overestimation of cost in a passive price policy (*i.e.*, infrequent changes, price-following). Under these assumptions, the firm's reaction to the behavior of others will be related to the number of biasing relay points through which cost data must pass relative to the number for demand data. In particular, it is predicted that the communication of demand data through a cost relay point will tend to produce a passive price policy, and the communication of cost data through a demand relay point an aggressive price policy. Similar deductions can be made with reference to communications downward regarding firm policy.

If the organization is stable, it is expected that the biasing of information will be reinforced by a learning phenomenon, resulting in a gradual lowering of the level in the communication hierarchy at which consistently suppressed information is filtered out of the communicated message. Thus, for example, if a given relay point has been transmitting information on the potential market but finds that this information is never retransmitted by the next relay point, and if there are no alternative channels of communication, the transmission of information on the potential market will tend to cease at the lower level.

III. *Two Extreme Models*

It is now possible to present two models that arise as antitheses from the propositions advanced above:[17]

1. A model of a firm in which price changes tend to be infrequent and reaction to competitors primarily passive might have the following organizational characteristics: (a) Price is determined by a committee of equals. (b) Communication chains between the decision-making unit and the primary sources of information are long (both upward and downward). (c) The unit making the actual price decisions does not have the responsibility for establishing the criteria for price decisions (*i.e.*, the decision-making unit is decentralized and is subject to dicta from above with respect to price policy). (d) Demand information is channeled through a cost relay point. (e) Firm policy information is channeled through a cost relay point. (f) Information on competitors is channeled through a cost relay point.

2. A model of a firm in which price changes tend to be frequent and reaction to competitors tends to take the form of price-leadership might have the following organizational characteristics: (a) Price is determined by an individual. (b) Communication chains between the decision-making unit and the primary sources of information are short

[17] It should be clear that these are only two out of a large number of permutations and combinations of organizational features that might be defined.

(both upward and downward). (c) The decision-maker for specific price decisions also has the responsibility for establishing the criteria for price decisions (*i.e.*, the decision-making unit is centralized). (d) Cost information is channeled through a demand relay point. (e) Firm policy information is channeled through a demand relay point.[18] (f) Information on competitors is channeled through a demand relay point.

In order to make explicit the implications found here for the analysis of the behavior of the firm, consider the predicted behavior in a classic duopoly situation of firms possessing the characteristics listed above. The Cournot duopoly model is taken for purposes of illustration.[19]

Let there be two duopolists in the market. Assume that Firm 1 has the organizational characteristics of the first model above, Firm 2 the organizational characteristics of the second model above. Following Cournot, let there be no costs.

The market demand function is defined to be:

$$p = 25 - \frac{x_1 + x_2}{3}$$

where p = price

x_1 = output of Firm 1

x_2 = output of Firm 2

It is further specified that each duopolist expects no reaction on the part of the other in response to a change in output:

$$\frac{dx_1}{dx_2} = \frac{dx_2}{dx_1} = 0 \text{ (conjectural variation terms)}$$

The Cournot market solution is reached by setting marginal revenue for each duopolist equal to zero (*i.e.*, the point of optimal production under the assumption of no costs) and solving the resulting equations.

(1) $$px_1 = 25x_1 - x_1\frac{(x_1 + x_2)}{3}$$

(2) $$\frac{dpx_1}{dx_1} = 25 - \frac{2x_1}{3} - \frac{x_2}{3} - \frac{x_1}{3}\frac{dx_2}{dx_1} = 0$$

(3) $$x_1 = \frac{75}{2} - \frac{x_2}{2}.$$

Similarly,

(4) $$x_2 = \frac{75}{2} - \frac{x_1}{2}$$

[18] Strictly speaking, if "(c)" holds, there are no channels of firm-policy information since firm policy is made by the decision maker; but in so far as one deals with approximations to the model, "(e)" becomes relevant.

[19] See *Recherches sur les Principes Mathematiques de la Theorie des Richesses* (Paris, 1838), Ch. 7. English translation: N. Bacon, Trans., *Researches into the Mathematical Principles of Wealth* (New York, 1897).

And thus,

$$x_1 = 25 \qquad (5)$$
$$x_2 = 25$$
$$p = 8.33$$

To explore some of the implications of this paper, assume that in the market specified above, Firm 1 and Firm 2 have reached the equilibrium point specified by the Cournot solution and are both producing 25 units. Next, assume that the market demand increases, such that

$$p = 30 - \frac{x_1 + x_2}{3}$$

Under the assumptions previously outlined, it is predicted that Firm 1 will tend (a) to be slow in changing its perception of the market demand, (b) to underestimate demand when its perception does change, and (c) to give a positive value to the conjectural variation term. Thus, Firm 1 might have expectations with regard to the market demand function and the conjectural variation term as follows:

$$p = 25 - \frac{x_1 + x_2}{3}$$

$$\frac{dx_2}{dx_1} = 1$$

Similarly, it is predicted that Firm 2 will tend (a) to change its perception of market demand quickly, (b) to overestimate demand, (c) to give a value of zero to the conjectural variation term. Thus Firm 2 might have the following estimates of key information:

$$p = 100 - x_1 - x_2$$

$$\frac{dx_1}{dx_2} = 0$$

Under these conditions, the market solution deviates significantly from the standard Cournot solution.

$$x_1 = 10$$
$$x_2 = 45$$
$$p = 11.67$$

The effect is to make Firm 2 dominant in the market.

Note that the solution above will be stable only if the new production level and the resultant profits are acceptable to the dominant control groups of the two firms. If, for example, the control groups of Firm 1 are not satisfied, they may demand a reorganization of the firm. Specifically, they may insist that its organizational structure be more like that of Firm 2. Such a reorganization would have obvious consequences for the estimation of demand, etc., with a resultant impact

upon the market. In point of fact, it is possible to specify a set of values for organizational structure and the aspiration level of control groups such that a market which has, under standard economic analysis, a given equilibrium point has, with the addition of the organizational factors, either a different equilibrium point or no stable equilibrium at all.

IV. *Program for Empirical Analysis*

In this paper a framework has been presented for dealing with certain variables which have not previously been formally introduced into oligopoly theory by economists but which, nevertheless, seem to be significant. That framework, and the hypotheses suggested, have been based explicitly upon a substantial body of empirical research previously reported in the literature of economics and the other social sciences. However, further refinement and testing of the hypotheses advanced here depends upon research specifically directed toward that end. While it is not the intention here to indicate in detail the types of empirical study that are being used to test the theoretical structure proposed above, some indication of the research program may be desirable.

Three stages of research are projected. On the basis of the framework outlined above, a myriad of models could be constructed by imputing values to the variables and by taking various combinations and permutations of these variables. Consequently, it seems clear that the most economical first step to be taken is a study within the theoretical framework defined in this paper of a number of firms in oligopolistic markets, with the goal of determining the patterns most commonly observed in the organizational variables specified above. Secondly, with constraints thus imposed upon the organizational variables, it will be possible to approximate more accurately the quantitative relationships existing. At this point, it is believed that the facilities of the laboratory can be exploited, since it is possible in the laboratory to study the effects of a single variable (or pair of variables, etc.) while holding others constant.[20] Such manipulation is ordinarily impossible in the study of

[20] In general, economists have not utilized laboratory studies to validate propositions concerning firm behavior to the same extent that students of the other social sciences have On the basis of the experience of social psychologists in the use of the laboratory for the observation of organizational phenomena, it seems possible to utilize such techniques for the study of pricing behavior For example, Harold Guetzkow, of the Carnegie Institute of Technology, has recently developed a laboratory design for testing certain propositions in organization theory. In his design, individual participants assume roles in sales and production departments in a firm and attempt to maximize firm profits in an experimentally standardized environment. Tests are made of the differences in profitability associated with differing organizational structures. It is anticipated that such a design can be modified, or a new design of this type developed, to provide experimental tests for the hypotheses relating pricing behavior and the organizational characteristics discussed in this paper.

existing organizations, although under some conditions environmental circumstances may, in essence, duplicate an experimental situation by providing examples of all possible combinations of values for the variables under examination. The advantages of the laboratory stem from the opportunity to guarantee such examples. Finally, on the basis of the clarification provided by the laboratory results and the preliminary field study, a set of hypotheses appropriate to actual situations will be made. These hypotheses will be in the form of specific predictions of the dimensions of price behavior listed above and will be tested systematically against actual organizational and market data. In this fashion, the hypotheses generated will be accepted or rejected and a further refinement of oligopoly theory will be feasible.

MORE ON THE MULTIPLIER EFFECTS OF A BALANCED BUDGET[1]

By WILLIAM J. BAUMOL AND MAURICE H. PESTON*

It seems to have become widely accepted among economic theorists that an increase in government expenditures on goods and services matched by an equal rise in taxes, will, subject to qualifications to be indicated presently, tend to result in a rise in national income equal to the tax-expenditure change.[2] In this paper we shall maintain that this argument is likely to be misleading in two respects. First, it suggests that there is something unique about the theory of the balanced budget multiplier which differentiates it sharply from other multiplier theory, in particular, because, as we shall see, the public's marginal propensity to save is alleged to be irrelevant for the process.[3] Second, the argument is misleading in that it appears by a feat of magic to be able to determine an empirical magnitude (the value of the multiplier) without the use of any empirical material. We believe that in this respect, though it involves correct deduction from its peculiar premises, the unit multiplier argument is really likely to be an irrelevant tautology because, as we shall argue, in practice there is very little assurance that unity is even a rough approximation to the multiplier associated with any balanced-budget expenditure program which a government may be expected to undertake.

Indeed, we have no reliable evidence on which to preclude even negative balanced budget multipliers or multipliers considerably in excess of unity. To a large extent this is the result of "leakages" in govern-

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[1] Most of the substance of this paper we owe to Professor Viner and Mr. Turvey. The former spent much time and effort in convincing one of us of the error of his views on this matter and a considerable part of our analysis can be traced to a rather obscure passage in the cited article by Turvey (pp. 284-86 [see end of this paper for all references]) where he had come to the same conclusions. While they both made highly useful suggestions on an earlier draft of this note they can, of course, not be held responsible for what happened to the baby after we adopted it, any more than can Professor Chandler who was our severest and most helpful critic. We must also express our gratitude for very useful comments to those who attended the faculty-graduate meetings of the economics departments of the University of California at Berkeley and Stanford University where this paper was given.

[2] *For an extensive list of references see* Samuelson's article, p. 140, footnote 5.

[3] But see Gurley's paper for a unified treatment which fits the balanced budget case directly into the general analysis.

mental expenditures, some of which have already been noted in the literature implicitly or explicitly. But we believe the full extent of their ability to affect the magnitude of the multiplier has not been recognized.

Our argument will be seen to apply equally well, *mutatis mutandis,* to all multiplier analysis, but it seems to us that the misunderstanding has been greatest in the balanced budget case.

We can perhaps best review the argument in question by quoting the following passage from Wallich (pp. 79-80), one of the original expositors:

> Suppose that national income is at a level of 130 billion dollars, and that this leaves without employment resources capable of producing ten billion dollars worth of goods and services. Now the personal income tax is raised to yield an extra ten billion dollars, and this money is employed, say, to build more roads, provide more free education, etc., previously idle resources thus finding employment. Incremental taxes and expenditures are so adjusted that the consumption and saving habits of taxpayers as a group are the same as those of the newly employed who are the recipients of incremental government expenditures. It is true that the additional tax reduces by ten billion dollars the purchasing power of those who are employed to begin with; this purchasing power, however, is not destroyed, but merely transferred to the hands of the newly employed. Since in their joint effect the additional taxes and expenditures are, by assumption, non-progressive, the consumption demand exercised by the newly employed will be the same as that which would have been exercised by the initially employed, had they not had to pay the tax. Aggregate private demand and private output therefore remain unchanged, but meanwhile there is an increase in government output equal to the ten billion dollars produced by the previously unemployed, which is paid for out of taxes and therefore is not dependent upon the level of aggregate demand. Thus national income has been raised to a total of 140 billion dollars.[4]

There are several well-known provisos attached to the argument:

1. The expenditure in question must involve a governmental purchase of goods and services rather than a transfer payment.[5] For a transfer payment merely redistributes income, and adds no governmental effective demand for output to that of the public.

2. The propensity to consume of the recipients of the expenditures

[4] Note that this argument attributes no peculiar powers to government. If it is valid, the same effect could, for example, be produced by a firm which simultaneously increased its saving and its investment expenditure by the same amount (*cf.* Samuelson, p. 151). It might be thought (as we did) that an equal change in imports and exports will also have a unit multiplier effect. But this is not so because, while a governmental balanced budget purchase will (at least initially) reduce the excess supply of goods available to the private sector, imports will increase supplies by just the amount they are decreased by the change in exports.

[5] See *e.g.*, Wallich, p. 82; Samuelson, pp. 142–43.

must, on balance, be the same as those of the payers of the tax.[6] Otherwise, even a transfer payment can affect national income if it takes money out of the hands of nonspenders and gives it to spenders. And governmental balanced-budget expenditure on goods and services will affect national income by changing private demands as well as by increasing the government's demands, and so increase national income by more or less than the amount the government spends.

3. The government's program must not affect the level of private investment. In particular it must not affect businessmen's views on the profitability of investment.[7] If, for example, they are led to fear increased governmental competition or if the taxes affect their incentives adversely, their reduced investment could offset some or even all of the expansionary effects of a governmental balanced-budget expenditure program. Similarly, businessmen's confidence in the program's ability to increase effective demand might further increase its effectiveness.

4. A closed economy is sometimes assumed. The reasons for this are not explained, though they are perhaps regarded as obvious.[8]

All of these qualifications already suggest that in practice a balanced budget might cause national income to go up by considerably more or less than the amount spent by the government. Later considerations will indicate that income might sometimes even be reduced.[9]

Though the effects of taxes have been mentioned in the literature and have already been referred to, there is somewhat more to be said in this connection. The unit multiplier argument takes the collection of T dollars in taxes to be equivalent to that much of a reduction in the public's income. For only then can it be argued simply that if taxpayers and expenditure recipients have the same marginal propensities to consume,

[6] See, *e.g.*, Haavelmo [1] p. 311, Wallich, p. 80; Samuelson, pp. 140, 141 footnote 6. It is also assumed by several of these writers that household saving is the only leakage in the system. Peston (pp. 129-30) has shown, however, (challenging Turvey on this point) that the balanced budget theorem is consistent with the existence of other leakages, and with indirect taxes in particular.

[7] See, *e.g.*, Wallich, p. 38; Samuelson, pp. 140, 141 footnote 6

[8] See, *e.g.*, Haavelmo [1] p. 314, but see White, p. 357 for an explicit discussion Another qualification which has received considerable attention in the literature involves the possibility of lags Thus if there is a time lag between the receipt of the taxes and their disbursement, only the long-run multiplier will approach unity. See the papers by Haberler, Goodwin, Hagen and Haavelmo [2] Other types of lag can be handled in the same way—for example there may be a lag between the time a businessman receives the money spent by the government on goods out of his inventory (when part of the money just adds to his liquid capital) and the time he hires labor, etc., to replace this inventory at which time that portion of the money first constitutes income.

[9] Most of the points raised in the next five paragraphs are made in considerably greater detail in White's valuable article where they are raised as part of a general discussion of the problems of empirical multiplier computation. But no mention is made of the consequences for the balanced budget multiplier theorem

the government's tax expenditure program will not affect private consumption demands. But taxes are ordinarily not the poll taxes of pure income redistribution theory. Besides their income effect they usually also have some substitution effects and result in changes in plans other than what might be expected to follow from a simple change in income.

Perhaps most obvious is the case of a general sales tax which, in so far as it is a tax on consumption, may encourage saving at the expense of consumption. Thus a given increase in tax receipts, if obtained in this way, may reduce consumption expenditure more than would the same reduction in disposable income. We may suspect, therefore, that the government's expenditure of the same amount will not raise the public's consumption by as much as its taxes have reduced it. In this case, the multiplier will be less than unity.[10]

For the same reasons we may expect that a tax on savings or a (foreseen) capital levy which is matched by an equal governmental expenditure on goods and services may well have a multiplier effect greater than one as people rush out to increase their consumption in an effort to avoid the taxes. Death duties and capital-gains taxes too may conceivably cause less of a contraction in the public's expenditures than does a simple reduction of disposable income by the same amount. A tax on imports (tariff) may actually even increase consumer demand for domestically produced articles, particularly if the elasticity of demand for imports is very high. Even if the money is collected out of ordinary income taxes, the balanced budget multiplier cannot be presumed to be unity, for people's incentives to earn income may be affected.

Having examined the assumptions on the nature of the tax structure inherent in the unit balanced budget multiplier argument we shall now, in a similar way, question its premises on the nature of governmental expenditures. The passage from Wallich quoted above suggests that the sort of governmental expenditure program to which the unit balanced budget multiplier argument is meant to apply is typified by road building, free education and the like. But such programs usually involve, to at least a small extent, the purchase of items other than domestically currently produced goods and services. While they may involve no transfer payments, they will usually include some purchases on capital account rather than on income account, and they will usually have some import content. For example, road or school-building construction often

[10] In Turvey's model such a situation yields a multiplier of zero because he assumes a "money illusion" which leads people to keep their money expenditures unaffected by sales taxes. In other words, consumption is made a function of disposable income, which is defined as receipts from factor sales plus transfers minus income taxes; and indirect taxes are made a function of consumption.

involves the purchase of land which affects the seller by increasing his liquidity rather than his income. This may induce him to spend more, but presumably not as much as the amount by which the taxpayers have reduced their expenditure.[11] The result will be similar if some of the government's purchases involve imported ingredients or items obtained out of unwanted inventory, old buildings, etc.

The existence of these "leakages" in a governmental tax-expenditure program—the nonredistributional effects on private consumption, the purchase of items on capital account and of goods from abroad—is, of course, well known, though no attempt seems to have been made to take account of them in the literature. Possibly some of the writers had them in mind but considered them unimportant, since presumably none of them considered the unit multiplier figure as more than an approximation to the empirical magnitude in view of the recognized qualifications. The magnitude of the leakages may indeed be rather small, and it is very tempting to conclude that if 10 per cent of the government's balanced budget expenditure is "leaked," the multiplier will be reduced from unity to say about 0.9. However, we argue now that fairly small leakages can even produce a negative balanced budget multiplier.[12]

Suppose, for example, that T dollars end up being collected in taxes all of which are spent in various ways, many of which involve some sort of leakage. Let us say, then, that of this amount only E dollars end up being added to expenditure on domestic goods and services coming out of current production.[13] National income will then end up being increased by the E dollars of the increased income-creating expenditure, but it will be reduced by private expenditures foregone as a result of the $E - T$ dollar reduction in private disposable income. Taking c as the marginal propensity to consume, this reduction in private expenditure, as is well known, is represented by

$$c(E - T) + c^2(E - T) + \cdots + c^N(E - T) + \cdots = \frac{E - T}{1 - c} - (E - T)$$
$$= \frac{E - T}{s} - (E - T)$$

where s is the private sector's marginal propensity to "save," that is

[11] Of course, this does involve a change in private investment but not necessarily a change in the inducement to invest.

[12] For a result which is structurally the same as the following see Higgins, pp. 394-95.

[13] Note that T and E represent final taxes and income-creating expenditures Actually, for example, T dollars may be collected as a result of a different amount, T^*, of new taxes being levied. For, by affecting the private sector's expenditures, the tax measure may affect the amount of taxes collected with any given tax structure. Similarly the legislated increase in expenditures may differ in magnitude from the increase actually attained, *e.g.*, because of the effect on employment compensation payments. For an analysis in terms of the taxes and expenditures initially undertaken, see Turvey.

to save, import and purchase items not currently produced or replaced.[14] Thus the total change in income, ΔY, will be given by the sum of this expression and the initial E dollar contribution to national income. This gives

$$\Delta Y = E + \frac{E - T}{s} - (E - T) = \frac{E - T}{s} + T.$$

The multiplier will then be

$$\frac{\Delta Y}{T} = \frac{E - T}{sT} + 1$$

which has a unit value in the special case where $E = T$.

Let k be the proportion of the tax not being added to income-creating expenditures so that $(1 - k)\ T = E$. Then our multiplier becomes

$$\frac{\Delta Y}{T} = \frac{(1 - k)T - T}{sT} + 1 = \frac{1 - k - 1}{s} + 1 = 1 - \frac{k}{s}.$$

Thus the multiplier will be positive, zero, or negative as the marginal propensity to save and import of the private sector is greater than, equal to, or less than k, the government's "marginal propensity to leak."

We can see now how misleading is Haavelmo when he argues that ". . . [Kaldor's] statement would seem to convey the idea that taxes equal to public expenditure can create employment only to the extent that they cut down on people's savings. This is not correct. We shall show below that public expenditures covered by taxes have an employment-generating effect which is *independent* of the numerical value of the propensity to consume."[15]

In line with what might be expected intuitively, our analysis indicates that a balanced-budget expenditure has an expansionary effect only if the government's "marginal propensity to leak" is less than the public's, that the expansionary effect will vary directly with the size of the public's marginal propensity to save, import, etc.,[16] and that the unit

[14] It will be noticed that c is not the straightforward marginal propensity to consume of elementary macro-theory. Rather it is the marginal propensity to consume currently domestically produced goods and services which are renewed. The significance of many of the leakages referred to in the text is that sometimes a consumption change involves a change in investment in the form of imports or inventory variation This, however, is not necessary to ensure a balanced budget multiplier other than unity.

[15] Haavelmo [1] p 312 The italics are Haavelmo's See also the approving reference to this in Samuelson, p 141, who objects to the conclusion only in the unstable case where $s = 0$.

[16] It is perhaps rather paradoxical to conclude that the magnitude of the balanced budget multiplier will be larger the greater is the marginal propensity to "save" of the private sector. The explanation is quite simple. Some of the money the government taxes away will not be returned to the public as income. The damaging effect will then be minimized if the public would have "saved" a large proportion of the income of which it has been deprived.

multiplier analysis is a direct consequence of the assumption that the government's marginal propensity to consume out of current domestic production of goods and services is unity. In this way we have removed the apparent peculiarity from the theoretical structure of the balanced budget multiplier which can now be seen to fit in directly with other multiplier analysis.

Furthermore, the analysis suggests that negative multipliers (or multipliers considerably greater than unity) are by no means out of the question.[17] We do not have adequate empirical information to assert that government's marginal propensities to import are typically smaller than those of the private sectors. Moreover, purchases on capital account may usually constitute a small proportion of public works expenditures but we really know very little about the magnitude of the private sector's marginal propensity to save or purchase on capital account against which this should be balanced. If we follow the usual multiplier analysis in assuming away any effects which occur outside the consumption sector, then business leakages are irrelevant. Of the remaining leakages certainly the average private propensity to save in this country has usually been rather small (about 1/20 to 1/10) and if the corresponding marginal propensity is anywhere in this neighborhood it might not take much in the way of governmental leakages for balanced-budget expenditure programs to exercise a contractionary effect on national income.

If the business sector were included in the discussion, we would add both to the induced expenditures and to the induced leakages. The average propensity to save would then no longer be negligible, but in this situation saving would only be a leakage if it were not undertaken to increase investment, *i.e.*, if it represented hoarding. This suggests that, if the public's marginal propensities to import and buy on capital account were the same as those of the government, the balanced budget multiplier might typically be rather close to zero. For the derivation of the usual proportion of the increased governmental revenue from excise taxation might, by discouraging consumption, tend to offset the small expansionary effect which works through the public's propensity to hoard. Of course, this sort of reasoning is always treacherous, and really insufficient to establish a presumption that the multiplier will in fact be low. Our aim is merely to indicate that on the information now available this possibility (among others) cannot be ruled out, and to suggest that *we really do not know much about its magnitude.*

In fact, there is no reason to believe that the magnitude of the balanced budget multiplier will remain unchanged with changing time and

[17] On this point the exposition in Baumol and Chandler is rather unsatisfactory. See pp. 349-51. But *cf.* p. 371, question 1.

circumstances. The following remark is presented primarily as an illustration of one way in which such variation may come about.

If it is true that the public's marginal propensities to save and import fall in a depression and rise at higher income levels, the expansionary effect of a governmental tax-balanced expenditure will tend to be reduced during periods of low national income and increased in more prosperous times. For, as we have seen, the higher the private sector's marginal propensity to "save," the lower will be the balanced budget multiplier. Thus an increase in balanced-budget expenditures may have untoward effects at all times, aggravating the cycle at both extremes.[18]

This result may perhaps be supported by an observation which involves the asset position of consumers. During a depression it is not unlikely that some people's consumption expenditure will be financed out of borrowing (which frequently takes the form of unavoidable arrears on rent payments, grocery bills, etc.). If it is assumed that these loans do not involve a decrease in consumption on the part of lenders, then, *ceteris paribus*, their repayment—in so far as it involves directly only an asset variation—will constitute a leakage in any expansion program. In other words, consumption out of a given income will be less than normal while consumers restore their net asset positions. It must be noted that often they do not have much choice in this matter. In addition, this consideration seems to lead to the conclusion that the sooner the expansion program gets under way, the larger will be its multiplier effect although other factors may be working in the opposite direction.

Of course, the government is not entirely powerless in these matters. By deliberately altering the composition of its purchases it can manipulate its "marginal propensity to leak." For example, a successful "Buy American" program could raise the balanced budget multiplier.

[18] A. G. Hart has suggested to one of the authors that the effect of investment on the balanced budget multiplier may work in the opposite way over the course of the cycle. The matched taxes and expenditures can reduce the liquid assets of business firms if they are designed to transfer purchasing power from nonconsumers to consumers. Many firms seem to be willing to invest out of borrowing only when it is supplemented by the flow of their own savings. In such a case their marginal propensity to invest may exceed unity. Thus any associated reduction in the earnings of business firms may, through its effect on investment, substantially reduce the magnitude of the balanced budget multiplier in prosperous, or even in moderately depressed times. In deep depression, argues Hart, investment will be at a minimum. Only absolutely unavoidable expenditures of this sort may be undertaken. Since the demand for investment will then be relatively inelastic the balanced budget multiplier will not be much affected by any reduction in disposable corporate income which results from an equal increase in governmental expenditures and taxes.

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BOOK REVIEWS

Economic Theory; General Economics

The Goals of Economic Life. Edited by A. DUDLEY WARD. (New York: Harper Bros. 1953. Pp. x, 470. $4.00.)

The Organizational Revolution. By KENNETH E. BOULDING. (New York: Harper Bros. 1953. Pp. xxxiv, 286. $3.50.)

These are the first two volumes in a six-volume study of Christian Ethics and Economic Life sponsored by the Department of the Church and Economic Life of the National Council of the Churches of Christ in the U.S.A. Charles P. Taft, chairman of the Department, explains in the foreword that this group recognized "that we need a more careful and realistic investigation of economic life and its relation to spiritual and moral values. . . . Accordingly, as a beginning of such an investigation, a three year research study was commenced in 1949 under a grant from the Rockefeller Foundation" (pp. viii and ix). *Goals of Economic Life* is a symposium in which economists, political scientists, theologians, and others attempt to assess the ethics of present-day economic goals; *The Organizational Revolution* is one of the more detailed studies in the series. These books cannot be ignored by anyone who is concerned with the ethical aspects of economic life.

The responsibility for passing ethical judgment upon our economic institutions was neglected by Protestantism until recently. Therefore, this semi-official attempt by American Protestantism to evaluate economic activity by Christian ethical standards is a step in the right direction. But the authors of these two volumes, while they sense a conflict between Christian ethics and our economic behavior, shrink from a fundamental examination of the problem. They tend to accept and to rationalize the traditional mores of Protestant Americans rather than to seek out the Christian ethical standards and use them as a basis for evaluation. As I explain below, the dust jacket statement that "the purpose of this important series is to define how ethical standards apply to the realities of earning a living and keeping the national economy stable and progressive," reveals the task actually undertaken by the books.

There are two important ways in which this statement of purpose and these volumes avoid a Christian appraisal of American economic life. First, they substitute "ethical standards" in general (by which is usually meant the standard of justice) for the Christian ethic of universal love. Confusion on this point is not, unfortunately, confined to these volumes; it is rampant in Christian groups today. Secondly, the widely accepted economic goals of American life, stability and progressiveness, in the sense of the achieving of ever higher material standards of living, are assumed, almost without discussion in these volumes, to be either good or essentially beyond the limits of ethical appraisal.

Professor Boulding's chapter in *Goals of Economic Life,* "Economic Progress as a Goal of Economic Life" presents a stimulating and unorthodox discussion of the measurement of economic progress; but it deals only briefly and superficially with what should be its central concern, the Christian evaluation of material progress as a goal. In general the authors do not even seriously question the ethical validity of material progress as a goal. Boulding acknowledges that: "The saints have usually seen clearly how the power to satisfy desire —of a worldly sort—itself increases the desire . . ." (p. 73) and admits that "There is much wisdom in this prophetic criticism of the quest for riches, whether on the part of an individual or a society" (p. 74). But this wisdom can apparently be dismissed in a couple of brief paragraphs.

Walton Hamilton gives similar cursory treatment to the wisdom of the ages. He observes that to the Christian Fathers, at least through the time of Aquinas, man held earthly possessions "in trust from God." On the next page he says, "A dominant moral requirement of our society is free play for the dynamic urge" (pp. 260-61). How this becomes "a moral requirement" for a Christian society is not, however, made clear.

To return to our first point: The distinction between the Christian standard of universal love and the classical standard of justice is ignored throughout most of these two volumes. Only Reinhold Niebuhr in the concluding chapter of *Goals of Economic Life* deals explicitly with the distinction. His treatment while tranchant seems seriously in error to the reviewer.

I agree that "any religious faith which merely discovers the law of love but does not also make men aware of the other law, that of self-love, is a sentimental perversion of Christianity" (p. 439). His error lies in his willingness to accept as Christian, "a practical compromise between the law of love and the law of self-love" (p. 441). In a crucial passage (p. 440) Niebuhr says: "It was an achievement of Catholic moral theory that it recognized the necessity of standards of justice for the institutional life of mankind below the level of love. But it was a weakness in the theory that love became a 'counsel of perfection' and lost its dialectical relation to the law of justice."

Niebuhr, it seems, is ready to accept justice as the "practical" ethical standard if it is recognized as a "tentative and provisional" standard and is kept in a "dialectical relation" to the law of love. He apparently accepts justice as the "practical" Christian ethical standard in the belief that it is unrealistic to appeal to men to live up to the law of universal brotherly love. But just such an appeal to men to live by the law of universal brotherly love is the distinctively Christian ethical standard. Niebuhr's position, it seems to me, renounces the prime ethical contribution of Jesus Christ: That man should love his neighbor—*and his enemy too;* that he should meet injustice by going the second mile, by giving the cloak to the taker of the coat; that he should be perfect even as his Father in Heaven is perfect. This is the essence of Christian ethics. The gospels make it apparent that Jesus Christ did not regard these teachings as too extreme for ordinary men. His commands for action on the basis of love, not justice, and for perfection, not for being a little better, were given to ordinary men—fishermen, tax collectors, etc.

The experience of St. Paul is also instructive on this point. As a Pharisee he

strove valiantly to obey the Jewish law—the commands of justice—and failed. As a Christian he tried to live according to the commands of love, honestly trying to treat all others as brothers, as members of the family, and he found it—contrary to all reason—more possible than trying to live by the law of justice.

The insights of modern psychology in support of the validity of the law of universal brotherly love are developed by Professor Snygg in his chapter on "The Psychological Basis of Human Values." Of all the papers in this book it seems the most pertinent contribution to the search for Christian goals. He presents a theory of human behavior which he calls the individual field approach (pp. 348-55). The individual seeks self-enhancement through role fulfillment. Snygg relates this approach to economic activity and to ethical behavior. Although he does not explicitly refer to religious authority, his statement is obviously couched in the terms of the Christian ethic when he says, "Law and ethics can help prevent injustice that we can recognize, but the best insurance against injustice is complete identification with the potential victim so that injury to the victim is injury to the self. The man who loves his neighbor as himself has not abandoned self-interest. He still seeks for self-maintenance and enhancement, but his self now includes his neighbor" (p. 359). Snygg recognizes the difficulties of achieving identification with an all-inclusive group. He wonders whether "it may follow that a man who loves all of mankind equally will not love any one person much" (p. 361). It should be noted that he reaches no conclusion. The point is crucial and needs more study. The experience of St. Francis and John Woolman should be reassuring on this point. Another answer may lie in his earlier suggestion that, "The ideal sought is a state in which the individual feels so much in harmony with the universe, so much a part of it, that he does not have to defend himself against any other part. It is significant that this state is said to have been achieved, at least in moments of ecstasy, by some of the saints. It probably involves the perception of the universe as one completely pervaded with infinite love and compassion for all living things. From this point of view the higher religions represent man's greatest insight in their recognition of the ultimate goal of human endeavor and their audacious attempt to move directly toward it" (pp. 352-53).

I have quoted these portions of Snygg's paper at length not only because of their intrinsic importance and relevance to Niebuhr's chapter, but because they shed light on important points in Boulding's book. Boulding rejects love as the ethical basis for large-scale organization on the basis of "laws of organizations themselves." "The family type of intimate relationship which is the highest expression of the spirit of love in human life," he writes, "can be achieved only *in an organization* of family size—i.e., a mere handful of people." "A society . . . which tries to apply a familistic ethic to a brontosaurian organization, will end," he asserts, "in a terroristic rigidity" (p. 178).

Boulding does not undertake to support by detailed discussion or citations the conclusions quoted above. In a volume on organization in a series on Christian ethics such cavalier dismissal of the basic Christian commandment as a principle of organization is unfortunate. It is particularly unfortunate

when the conclusion is contrary to competent professional opinion expressed in an earlier volume of the series, for while Snygg is agnostic on the possible success of *universal* love as an organizational principle, he evidently believes that love is a workable basis for groups well beyond family size. Snygg tries to come to grips with the problem of whether love, the distinctively Christian ethical standard, is an adequate motivational basis for organized society; Boulding simply rejects it, essentially without discussion.

Niebuhr, although he accepts Snygg's suggestion that "human existence, when profoundly analyzed, yields the law of love as the final law of human freedom," believes that "politics (and for that matter economics too) must assume the selfishness of men" (p. 439). He states as a "basic assurance," "that men must be engaged primarily through their self-interest to participate in . . . economic life . . ." (p. 434). This is something quite different from the mere recognition of the selfishness of man as a (regrettable) fact. It is the acceptance of self-interest and the scrapping of the Christian law of love as an organizational principle of economic life. Niebuhr is in distinguished company in his rejection of "the benevolence of the butcher, the brewer, or the baker," as a basis for economic motivation. The imprimatur of the professor of moral philosophy in the University of Glasgow that there is nothing ethically objectionable in self-interest as a principle for economic motivation is widely accepted among English-speaking Protestants.

There is incidental questioning of this idea in the present volume; for instance, Neibuhr calls attention to the dubious nature of Adam Smith's "assurance of the beneficent effect of the [unseen] hand." Similarly, Hamilton notes that, "Adam Smith, unlike many of those who now quote him, was too moral a man to venerate self-interest in the raw. . . . He would . . . if necessary have society interfere with its controls to make certain that the pursuit of gain was made to serve a public purpose" (p. 261). And J. M. Clark recognizes as a problem the fact that the market mechanism is not neutral as a device for choosing wants which are to be satisfied. Professor Bennett in his chapter "A Theological Conception of Goals for Economic Life" goes even further. He draws attention to "the moral dangers in a society that puts its chief emphasis upon the motive of self-interest." The capitalistic theorist "assumes too readily the innocence of self-interest because in a competitive society those who are seeking their own profit are supposed to be serving the common good. We have learned from bitter experience that the cultural support for unlimited acquisitiveness trains men in tendencies to which they are already inclined and causes them to develop institutions for the exploitation of the community in their own interests" (p. 412). "Persons are corrupted by the moral climate created by great emphasis on personal financial gain, by false standards of success, by almost unconsciously dishonest advertising and salesmanship, by the commercial stimulation of materialism and vulgarity in popular tastes. This subtle type of corruption instead of providing clear moral issues, the facing of which produces character, undermines character before people are aware of what is happening" (p. 418).

Unfortunately, however, none of the authors deals at all fully with the

ethical problems posed for the Christian by the self-interest motivation. There is a general willingness throughout these volumes to accept this motivation with little question. There is only vague recognition of the fact that, if self-interest is served by society and accepted as a proper motivation, then the self-love aspect of human nature will be nourished while further growth of the other more divine aspect of human nature, love of others, will not be promoted. Thus in our society the selfish aspects of human nature are given greater relative dominance. Such dominance of self-interestedness may well threaten our whole social and economic structure for, as J. M. Clark notes, it is essential that "the sense of right [should become] an increasingly active feature of economic life, and social responsibility in the use of group power has become an absolute necessity, if the industrial system is to go on working on a basis containing enough freedom to be fairly characterized as voluntary" (p. 25). It is not enough, as Niebuhr seems to suggest, that the Christian law of love have a "dialectical relation" to the law of justice. The goal of Christianity is that the law of love become the basis of action and thus transcend and hence replace the law of justice, not that it merely progressively elevate the law of justice by its dialectic contrast. To say that this goal is unattainable is to reject the very specific commandments of Jesus Christ.

Within the limits of a review it is impossible to deal fully with the contributions of each of the fifteen authors of *Goals of Economic Life* separately. Attention should be called to a few outstanding points. Clark presents a series of admirable vignettes on the development of some ethical aspects of economic doctrine; and Danhof, Hamilton, and Boulding comment suggestively on the history of European and American economic and social ideas. Heimann's paper on "Comparative Economic Systems," while difficult to follow, comes close to the central issues in its appraisals. We must await with high expectations a more complete treatment in his promised book. Linton provides a challenge with his anthropological basis for an evaluation of our economic institutions. Unfortunately he does not relate his anthropological insights to Christian values.

Because most of the authors of *Goals of Economic Life* accept the law of justice as the Christian ethical standard, these essays (with the exception of Snygg's) fail to study seriously the really basic question which the Christian should ask about economic life: Can the concept of love of others as the basis for action serve as the organizing principle of an economic system, and if so, how?[1] Neither do these essays examine the question which is at least implicit in Niebuhr's analysis: How should our "tentative," "provisional" and "relative" standards of justice be revised and elevated through a "dialectical relation" (Niebuhr's term, not Marx's) with the law of love?

The ethical question which occupies these authors for the most part is the important but much less challenging one: How do American economic practices fall short of the ethical standard of justice which Americans generally accept?

[1] Boulding in *The Organizational Revolution*, as noted above, declares without serious study that universal love is unworkable as the basis for *social* organization.

As an answer to this question the symposium is a success. However, in a more basic sense it is a disappointment because the participants in this ambitious study to do not come to grips with the fundamental problem: a really Christian ethical appraisal of economic goals. These papers show no evidence of the "more careful and realistic investigation of economic life" which Mr. Taft outlined as the aim of the study. They present, rather, the ethical ideas which are held generally by American Protestants.

In spite of this shortcoming the book should be read by those who are concerned with the application of ethics to economic life. The book has a high level of economic literacy, which is often lacking in such discussions. As collateral reading for advanced undergraduates it should prove stimulating and instructive.

Boulding's analysis in *The Organizational Revolution* is more sociological and political than it is economic. For such an anlysis an economist may not be the appropriate critic of another economist's efforts. His principal thesis is "that the organizational revolution of our time has been in the main the result of certain technical changes in the ability to organize: changes both on the physical side in the improvement of transportation and communication, and on the structural side in the forms and skills of organization itself" (p. 49). The development of loyalty patterns which have made possible loyalties to organizations other than the family, the church and the state, has been of at least as great importance. When they could command loyalty, large, complex, far-flung organizations persisted for centuries in premodern times, even if they did not function efficiently. On the other hand, the corporation functions poorly in many areas today not because of lack of technology but because of lack of loyalty. Loyalty to economic organizations and what Boulding calls "the 'minor virtues'—honesty, truthfulness, punctuality, faithfulness in the fulfillment of promises, sobriety, attention to business" (p. 140) are the keys to the remarkable development of organization in the modern world as much as technological changes.

Boulding's analysis of organizations has the shortcomings pointed out earlier: it accepts progressiveness or as he terms it, "the spirit of enterprise" as the important thing (p. 158) and it fails to see the dangers of the Smithian self-interest solution. He reflects the curious ambivalence in Protestantism. Love is described as the major Christian virtue (p. 140) but self-interest must be relied upon for political and economic organization. This uncertain attitude toward the Christian ethic of love is epitomized when he rejects love as the organizational principle for any organization larger than the family on page 178 and then, on page 198 appeals for world organization on the basis of love.

Boulding's case studies of the ethics of the labor movement, the farm and business organizations and the national state as organization are instructive although a bit unfair to labor and too kind to farmers and business.

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A Study in the Theory of Economic Evolution. By TRYGVE HAAVELMO. (Amsterdam: North-Holland Publishing Company. 1954. Pp. 114. $2.00.)

Haavelmo puts the question in an interesting and novel way: how are we to explain the fact of gross economic dissimilarities? Why is one country rich and another poor? Why is one region economically and technologically advanced and its neighbor primitive? This is one of those tricky problems where it is only too easy to find answers, too many answers, and the fine art of the theorist is to pick out the illuminating and fruitful ones. At the very beginning Haavelmo rules out the easy verdict that "people are just different" —which explains everything and therefore explains nothing. He argues that the basic idea underlying and justifying international development programs is that the human material is essentially homogeneous. The theory that goes along with this practice should proceed from the same assumption. This is not at all to deny that the process of economic development itself leaves deep and irreversible marks on the capacities and motivations of people. In his formal mathematical models Haavelmo tries to introduce this powerful effect by including a variable which stands for the cumulated level of education and know-how. He makes it depend somehow on income or capital per head and in turn it works on the technological level, the birth rate, and perhaps the propensity to save of the population. If he does not completely succeed in making the model ring true, who is to cast the first stone?

A case could be made that Haavelmo underrates the importance of such factors as climate and resource endowment. After all, there are no "developed" tropical countries and hardly any "developed" nonindustrial countries. This is unlikely to be sheer accident. But even so, one can find enough cases which are not explainable on these grounds so that much force remains in Haavelmo's argument. We may leave aside also the influence of social and cultural variation (Calvinism, for example). Formal economics must draw the line somewhere.

This leaves three by no means mutually exclusive sources of dissimilarity to investigate: differences in structural parameters, differences in initial conditions, and the cumulative effect of random disturbances. Most of the book is given over to discussion of these, partly in terms of a series of mathematical models, and partly in general terms, but always abstractly, even philosophically. It is easy to see that in growing systems even minor differences in structural parameters can build up eventually into great divergences. If one identical twin starts with an inheritance of ten dollars and the other with nine and if their bank pays 3% compound interest, then the first will be much richer than the second by the time they are as old as a country can get to be. Alternatively if their inheritances are equal but the first twin's bank pays 3.01% their fortunes will again diverge. In the first case, the twins' bank accounts will remain forever in the same ratio in which they started, although as both grow rich the difference between them increases. One could argue that in this case the ultimate difference is really "no greater" than the initial difference, properly measured. After all in any dynamic system it is hard to say what

one means by "minor" differences in parameters, other than those which give rise to "minor" differences in development. In the second case, not even the ratio of the twins' fortunes remains constant; by this criterion there is no such think as a minor difference in rates of growth. Perhaps one should not consider such long periods—but this question cannot be decided on a high level of abstraction. In any case Haavelmo has much of interest to say on such questions.

The role of initial conditions is even more interesting, and Haavelmo seems to lay greater weight on them. His nonlinear models show what linear models never can: that initial conditions can be of fundamental importance. With the same structural constants, some starting-points can lead to growth, others to stagnation or decline. There are "humps" to be climbed. Even here there are subtleties and paradoxes. It is not always clear what are initial conditions and what are structural parameters: the distinction is economic not mathematical. Moreover, to ascribe differences in development to differences in initial conditions seems like begging the question. Initial conditions are only the results of previous development. But again to draw the line somewhere may not be as arbitrary as it sounds, especially when we take account of the irreversible aspects of economic and social history.

The chapter on the effects of random shocks on growing systems is on the technical side, but its conclusion is that such unpredictable and uncontrollable events can easily have the effect of creating, preserving, and even magnifying the long-run results. If our twin brothers, now with the same inheritance and the same bank, engage in tossing a fair coin it is quite likely that one will wind up supporting the other.

The book ends with an interesting discussion of "economic history as an irreversible process of trial and error." There should be some room for the notion of social choice in models of economic growth. I have no idea what the prospects are for progress in this direction. The long run is deceptively hard to analyze, if only because analytical errors, along with everything else, get magnified.

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Monopoly and Competition and their Regulation. Edited by E. H. CHAMBERLIN. (New York: St. Martin's Press. London: Macmillan. 1954. Pp. xvi, 5549. $7.50.)

This book incorporates the product of the Round Table meeting of the International Economic Association which was held in Talloires, Haute Savoie, France in September 1951. In addition to 24 papers it includes a substantial summary record of the debate prepared by Elizabeth Henderson. The papers may be said to fall into three fairly distinct categories: (1) those descriptive of the market structure, the character of public policy, and the cultural values and attitudes prevalent in various countries with respect to competition and monopoly; (2) those dealing primarily with theoretical issues; and (3) those dealing with public policy objectives and techniques.

The country papers deal with Canada (V. W. Bladen), France (R. Goetz-

Girey), Italy (F. Vito), Union of South Africa (W. F. J. Steenkamp), United Kingdom (G. C. Allen), United States of America (R. B. Heflebower), Western Germany (F. Boehm), and Scandinavia (H. Brems). These papers are on the whole disappointing. To begin with, the information available on market structures and patterns of behavior in most, if not all, countries is woefully inadequate. Information is adequate only in connection with legislation affecting competition and monopoly. As a consequence some of the papers tend to be no more than a summary and rather spiritless description of the law of the land as it affects competition and monopoly. Second, there is evidence that (with some exceptions) the problem to which the authors address themselves is not of vital concern to them. This should not be especially surprising. The issues under discussion have aroused much more intense interest and public debate in the United States than anywhere else in the world. The general outline of the issues which the authors were asked to examine reflects an American's conception of the issues—a conception which contrasts rather sharply with its European counterpart. One has the feeling that, if the participants had been given a much freer hand in formulating the problems, the country papers might have been stimulating and provocative. Vito's remark that in Italy "competition as such is not highly rated in our value system—it receives appreciation within the limits it contributes towards a superior aim of community life" brings home in a rather striking fashion the issue of cultural relevance of the problems under discussion. Heflebower's optimistic statement concerning the extent and the desirability of competition in the United States is matched by the scepticism of the European participants both as to the extent and as to the desirability and feasibility of competition in their countries. Characteristic in this respect is E. A. G. Robinson's statement in the course of the debate that "listening to successive American speakers, he had felt as if (he were) listening to a 'harmony glee club.' " Finally, with regard to the country papers, W. F. J. Steenkamp's discussion of the relation between the growth of an underdeveloped economy and monopoly contains a number of highly promising insights.

Among the theoretical papers there are some truly outstanding contributions. J. S. Bain's discussion of "Conditions of Entry and the Emergence of Monopoly," S. Lombardini's "Monopoly and Rigidities in the Economic System," and P. Hennipman's "Monopoly: Impediment or Stimulus to Economic Progress" represent top-drawer performances and should be put high on the reading list of specialists in the field. The other theoretically inclined papers contain much that is interesting, but do not extend our horizon to any significant extent. These papers include Joan Robinson's "The Impossibility of Competition," E. H. Chamberlin's "Measuring the Degree of Monopoly and Competition," I. Svennilson's "Monopoly, Efficiency, and the Structure of Industry," Jane Auber-Krier's "Monopolistic and Imperfect Competion in Retail Trade," K. Rothschild's "The Wastes of Competition," and F. Machlup's "Monopoly and the Problem of Economic Stability."

It is impossible to discuss the content of individual papers. An attempt might be made, however, to state the general character of the approach and the sense of problem that dominates most if not all the theoretical papers. To

begin with, there seems to be general agreement that traditional theory concerning market structure and associated behavior and performance is dead but not quite buried. It is clear that the doctrine of "workable competition" has made substantial inroads in the thinking of the theorists. It is also clear, however, that no systematic body of thought has been formulated which can be substituted for traditional structure-behavior-performance theory. Some of the papers strive to formulate such a theory in terms of behavior or conduct (emphasizing such things as *active* competition, or competitive pressure, or potential competition, etc.) whereas others attempt to associate structure with performance in a more direct fashion. There is general dissatisfaction with static analysis—but no attempt is being made to replace it completely with either a dynamic or an evolutionary, growth-oriented model. One is left with the feeling that traditional neoclassical doctrine is most inadequate in explaining or predicting behavior or performance from structure—but that the task of putting something in its place has barely begun. Similar remarks can be made in connection with the standards, welfare criteria or value systems in respect to which the performance emerging from structures is to be evaluated. All agree that perfect competition as a standard is dead. The substitute in most cases, however, seems to take the form of *ad hoc*, casuistic theorizing.

The last group of papers deals with problems of public policy rather than theory. F. A. McGregor's paper on "Canadian Techniques" should provide much food for thought to American students of antitrust law and its enforcement in the United States. The papers by W. J. Jöhr on the "Regulation of Competition" and J. M. Clark on "Competition and the Objectives of Government Policy" are highly readable. It is of some interest perhaps that the public policy papers tend to treat competition as a concept of conduct rather than as a concept of structure or performance. The "workable competition" which emerges from these papers tends to be formulated in terms of behavior patterns rather than in terms of market results. C. D. Edward's paper on the "Issues in the Monopoly Problem" may be classed in the public policy category though there is much in it that deals with theory. It contains a list of highly penetrating questions. It is an excellent statement of the state of ignorance of the profession. Finally, one should mention W. A. Lewis' "Recent British Experience in Nationalization" and J. M. Jeanneney's "Nationalization in France." Both papers serve to emphasize the fact that nationalization *per se* solves no problems—that the question of objectives and criteria of public policy may be raised as acutely in the "regulation" of nationalized as it is raised in the regulation of private businesses.

It may be evident by now that the reaction of this reviewer to the volume as a whole is rather mixed. Quite a few of the papers are masterpieces. Some are rather mediocre and run of the mill. Even the best, however, do no more than raise the problems with which this generation of economists must deal, if it is to make any contribution to the issues of theory and policy which it has inherited from the past.

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Uncertainty and Business Decisions—A Symposium. Edited by C. F. CARTER, G. P. MEREDITH and G. L. S. SHACKLE. (Liverpool: The University Press. 1954. Pp. viii, 101. 10*s*, 6*d*.)

This volume contains seven papers delivered at a meeting devoted to discussion of the problem of decision-making under uncertainty, with special reference to the ideas put forward in G. L. S. Shackle's *Expectation in Economics.* A brief summary by Shackle of his own theory helps to make the book self-contained, and there are several additional, minor contributions.

Shackle's views cannot be adequately summarized here, but the most crucial contentions are the following. (1) The decision-maker will associate a degree of "potential surprise" (y) with the value (x) of each possible outcome of a course of action; "surprise" is a psychological magnitude, not connected with "frequency-ratio probability." (2) Courses of action will be evaluated by the decision-maker *exclusively* in terms of two outcomes—those which attain the highest favorable and unfavorable values on a psychological "stimulation-function" $\varphi(x,y)$ (stimulation varies inversely with y and directly with the absolute value of x). Shackle's theory is descriptive, arguing that men do behave in the way indicated, not that they necessarily should. It is a psychological theory of decision: it argues, for example, that men ignore mathematical expectation—which, as an "unappealing, unexciting abstraction," is supposed to lack the power to stimulate the mind.

D. J. O'Connor accepts Shackle's theory as an explanation of subjective expectation, but argues (following Russell) that some kind of theory of objective *credibility* is still needed. O'Connor, unlike Shackle, accepts the frequency interpretation of probability as a guide to credibility for some situations, maintaining only that a rather different guide is needed for situations which are unique or unrepeatable. Such a guide may be needed for situations which are "unique" in the sense that probabilities are completely unknown. Shackle also claims, however, that even where probabilities are known they are *irrelevant,* provided that the decision is unique or unrepeatable (for example, if it involves a large fraction of one's wealth or life itself). This view is surely wrong. If life or death depends on calling correctly the fall of a not necessarily fair coin, no reasonable person would find recorded frequencies of heads and tails for that coin irrelevant for his decision.

C. F. Carter points out that if the φ-function is to have a definite maximum, both x and y must be defined as cardinal magnitudes. Carter criticizes Shackle's theory for its arbitrary concentration on just two outcomes and also for its assumption that all outcomes with equal surprise have the same "degree of belief," using the latter term to indicate subjective probability valuation.[1]

[1] Carter is correct in sensing a difficulty with Shackle's theory here, though his discussion of it is confusing because he fails to mention that he defines "degree of belief" differently from Shackle. The latter's "degree of belief" is a function of two surprises—that associated with a hypothesis and another with its contradiction, while Carter's is a simple subjective probability ordering. That there is a difficulty with Shackle's definition is indicated by the following example. By Shackle's Postulate 9, at least one possible hand of 13 cards at bridge must carry zero surprise. The contradiction of the hypothesis that I will receive this hand (*i.e.*, the hypothesis that I will receive any of all the other possible hands) must also be

To avoid these difficulties Carter presents a revised theory of expectations. Possible outcomes are divided into groups according to degree of belief, and courses of action are examined by comparing their outcomes for each possible state of the world, each such state (*e.g.*, war next year) being associated with a particular degree of belief. Carter, though he perhaps does not realize it, is on familiar territory here: unlike Shackle, he really views the problem of decision-making under uncertainty along traditional lines, the only substantial departure being his insistence on grouping the outcomes into a small number of ordinally defined equal-belief groups (this is due to a supposed inability of the human mind to contemplate a continuous variable). Carter's prescription for action differs, however, from the traditional one (maximizing expected utility, with subjective or objective probabilities as weights) because of the ordinal nature of his degrees of belief. In general, his prescription will not lead to a solution; that is to say, except in special cases where something like dominance exists, there remains an irreducible doubt. This is possibly a fruitful idea (it is related to some of Shackle's work)—interesting consequences can perhaps be drawn from a theory of indecision, though Carter does not pursue the question further.

Lack of space precludes detailed discussion of several other contributions. W. B. Gallie argues that analysis of "what is contingent or irreducibly uncertain" in human affairs has been slighted as a result of failure to realize that scientific laws do not and can never totally depict reality. While this view of scientific laws seems reasonable, there is a long history (starting with Bayes and D. Bernoulli) of thoughtful analysis of the problem of decision-making under uncertainty which Gallie ignores. B. R. Williams stresses the importance of uncertainty in various parts of economic theory, especially the theory of profit.

Some special mention must be made of the paper by I. J. Good, which is a fascinating hodgepodge of methodological ideas, definitions, remarks and suggestions defying brief summary. Good maintains a subjective theory of probability, outlined in his valuable book *Probability and the Weighing of Evidence*. The reader should be warned, however, that Weaver's "surprise index" discussed by Good is no close relative of Shackle's, being an inverse of elements in a probability distribution rather than a psychological magnitude.

Because of the extraordinary dependence of Shackle's theory upon his special (and therefore refutable) hypotheses about the psychology of the decision-making process, interest naturally attaches to the contributions of G. P. Meredith, a psychologist, and A. D. Roy, whose topic was the possibility of testing alternative theories of uncertainty. Unfortunately, Meredith in discussing a wide variety of topics neglects Shackle's crucial psychological contention: to wit, that one single point on the favorable side of the φ-surface has the power to eclipse all other favorable outcomes and concentrate all

assigned zero surprise (footnote on p. 113 of *Expectation in Economics*, 2nd ed., and Postulate 6). But then my degrees of belief (Shackle's definition) in the two hypotheses are equal (by Postulate 1). This is completely unreasonable.

attention on itself; and similarly on the unfavorable side. Roy does not propose any specific tests, indicating that the alternative theories are as yet so incompletely developed that case studies are likely to yield more information than experiments.[2] Both postulates and consequences of Shackle's theory, however, do seem sufficiently clear to warrant an attempt to square theory with observation. Shackle himself has pointed out a discrepancy here—his theory appears to have the consequence that a speculator will in general hold all his resources in only two assets. The absence of comparisons of fact and theory or of modifications of theory in the light of such comparisons is the chief cause of a certain disappointment the reviewer felt in the volume.

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[2] A survey of various experiments bearing on the economic theory of choice may be found, however, in W Edwards, "The Theory of Decision Making," *Psych Bull.*, July 1954, LI, 380-417

Wirtschaftssysteme und Gesellschaftssysteme. By EDUARD HEIMANN. Veroeffentlichungen der Akademie fuer Gemeinwirtschaft Hamburg. (Tuebingen: J. C. B. Mohr (Paul Siebeck). 1954. Pp. xii, 250. DM 16.50; cloth, DM 19.80.)

Through these pages vibrates the passion of a writer who wants his message to be heard. The volume offers economic analyses, sociological essays, theological observations. But all that is only a means of conveying the message: Only a rejuvenation of Christian faith can make possible a creative solution of the mortal threat to western civilization.

This statement of what seems to be the final aim of this book may appear to disqualify it for a review in a professional journal of economics. Nevertheless, I appreciate it that the editor of the *American Economic Review* wants this book brought to the attention of the profession. This is justified on two grounds.

1. Heimann has brought together in this book the German translation of a number of studies published in English during the last twenty years.[1] These contain valuable but not easily accessible contributions to the literature on major socio-economic topics. The analyses of planning in totalitarian and liberal societies; the role of labor unions, trends in agriculture, class struggle, imperialism and colonialism, these and others will be of interest even to those who dismiss Heimann's main message as "nonscientific."

2. Furthermore, in our age of specialization in economics, it is necessary to remind the student of economics of the essential unity of the social sciences. In working on specialized economic topics he should remember the noneconomic assumptions which usually are taken for granted. Heimann demon-

[1] About one-third of the book has been written especially for this publication. Also, previously published parts are so edited and supplemented that the book is now somewhere between a systematic treatment and a collection of essays. There is a great number of references to other works by the same author, some published, others in manuscript form.

strates this unity once in his book by the following example: "... the smooth operation of the [market] economy requires a certain degree of reliability and compatibility of the people, and this minimum is assured through the spiritual-moral-religious characteristics of the society at the present time" (224). He then raises the question as to whether under present trends the continuation of these prerequisites of the modern economic organization is assured. Another example is related to the quasireligious element in Marxism which is important for an understanding of Soviet Communism; or the question as to the spiritual aspirations of the former colonial countries which is decisive for an understanding of the economics and politics of the underdeveloped countries. A work which deals with these relationships between spiritual and ideological developments and the developments of economic institutions and processes should be of interest to the economic profession.

One of the main concerns of the author is to elaborate on the contrast between and the similarity of capitalism and communism. These he regards as the two pure systems of what he calls "economic rationalism." He believes that it is common to both systems that economic values (such as maximization of income or consumption) are established as the purposes of the economic process, separated from their cultural and social context. These systems alone lend themselves therefore to the development of economics as an autonomous, separate science. Both systems are based, however, on unrealistic and evil philosophical assumptions—individualism in the one case, collectivism in the other. Both do violence to the dignity and freedom of the human being in the social community (p. 240) which Heimann regards as two interrelated supplementary concepts. That these systems can work to some extent in reality is due to the fact that "the secularized society is viable as long as it still has the unofficial religious inheritance at its disposal" (p. 226).

Heimann regards capitalism (that is, *laissez-faire* capitalism) and communism as pure types and not as anything existing in reality. He sketches the economic system as it is evolving in Western countries under the title of "Liberal Democracy." This appears as a kind of capitalism mitigated by social reforms. He also contrasts both capitalism and communism with socialism. He defines socialism not by any specific institutional arrangements (such as the conventional nationalization of industries) but by reference to a variety of institutions which may develop under a "common faith" (p. 41). His examples are cooperatives, public corporations (like the Tennessee Valley Authority or the British Broadcasting Corporation), private foundations, and private enterprises in fields in which competition can be effective. Socialism consists of nontotalitarian planning and noncapitalistic markets.

A considerable weakness of the book lies in the fact that Heimann has failed to clarify the relationship between the historically evolving systems of "liberal democracy" and his concept of socialism. At times one has the impression that Heimann would like to say that through the force of social, political and economic exigencies we are somehow drifting in the right direction of a truly viable and quite effective economic system. And then it seems he cannot quite accept this theory because that new system should be created in connection with a religious rejuvenation of which only the first pioneers have appeared

(p. 240) and their impact on the remaking of western civilization can at best be in its beginnings.

In spite of a number of questions and reservations concerning the analyses and interpretations of the book I wish that it could be made available to English-reading economists. I say this because the author is struggling with truly important problems which are not adequately discussed in our professional literature. Here they are treated by a competent scholar in a spirit of great sincerity, although I feel that he has not succeeded in fully integrating his religious concern with his socio-economic analyses.

GERHARD COLM

Washington, D.C.

Sulla teoria matematica della economia politica. By G. B. ANTONELLI. Edited by G. Demaria. (Milan: R. Malfasi. 1952. Pp. 126. L. 1,000.)

G. B. Antonelli (1858-1944) was an engineer of considerable professional standing who, like so many others trained to that vocation in the nineteenth century, felt impelled to augment the literature of the burgeoning science of economics also. In a spectrum of engineer-economists he probably deserves a place nearer, say, to Launhardt than to Sorel or Pareto, for his interest in economics was scarcely perdurable; he made only two major incursions into the field—fifty years apart. Nevertheless, one of these—the essay which has afforded the title and the reason for the small volume noted here—may well be of interest to economists with a theoretical bent, and Professor Giovanni Demaria deserves thanks for having rediscovered and reprinted it.

The book itself consists of three related items, all of which appeared in the *Giornale degli economisti* in 1951. In addition to the title-piece (first published in 1886 as a monograph) there is a prefatory historical note by Demaria and an exegesis of Antonelli's mathematics by Giovanni Ricci, professor of analysis at Milan, which among other things contains (pp. 96-98) a most persuasive discourse on the role of mathematics in economic analysis.

Theorists and chroniclers of theory may find the book interesting in several respects. One of these is that Antonelli's essay, which was originally intended to be the introductory chapter of a full-scale treatise on economics, was the first of a considerable number of rather aridly mathematical disquisitions on "pure economics," a genre which at the hands of Barone, Amoroso, and a host of others was to become in time a sort of specialty of the country. (At the time Antonelli's essay first appeared, Pareto was still a political feudist rather than an economic theorist.) Furthermore, aside from denoting, so to speak, a point of inflection in the trend of Italian economic literature, the essay possesses substantive interest. For one thing, the skill with which Antonelli deployed his files of equations and phalanxes of determinants in traversing the treacherous terrain of utility and price theory is remarkable since, economically speaking, he was *autodidattico*. Again: Antonelli was probably the first (anticipating by twenty years Volterra's criticism of Pareto's *Manuel*) to raise the thorny question of the integrability—*i.e.*, validity—of utility functions where more than two goods are involved (pp. 29-32).

As is quite proper in view of its historical nature, several typographical

errors have been perpetuated in this reprinting, for example on pages 19, 20, and 25. But this has not made Antonelli's essay easier to read, and some at least will find more nourishment in the explanatory articles which sandwich it in than they will in the Antonellian meat.

A. STUART HALL

University of Illinois

The Determination of Production: an Introduction to the Study of Economizing Activity. By BURGESS CAMERON. (New York: Cambridge University Press. 1954. Pp. xv, 100. $3.75.)

Boiling down the greater portion of basic economic theory to an even hundred pages is a considerable feat in itself. To do so without substantial loss, and even with a greater flavor of realism than is generally found, as it seems to me Cameron has done, is remarkable indeed.

Cameron's emphasis is on the general equilibrium of the system. He develops the theory by presenting a series of nine models, each involving some further generalization of the preceding one. Beginning with the case of consumption in fixed proportions and production with fixed technical coefficients, the model is modified in successive chapters to include consumer choice, factor substitution, investment, money, etc. and discussion is given to such matters as location, the state, monopoly, size of firm and so on. Most of the models are illustrated by numerical examples.

The result is a book which differs from the usual text in a number of ways. Most noticeable, and in light of the subtitle, perhaps most surprising, is the fact that the theory is exclusively positive: there is a complete absence of welfare theory as such. Secondly, the emphasis on general equilibrium and its presentation by successive models means that such topics as consumer theory, the theory of the firm, etc., appear as successive qualifications to the theory; they are not first treated individually and then put together as a system. In other words, the theory of the firm is an elaboration of the general theory of production, the latter is not built up from the former. However, since the successive modifications of the model require separate treatment of these topics, the pedagogical difference is less than might appear at first sight. The emphasis on general equilibrium likewise leads to an integrated treatment of the problems of allocation of production on the one hand and determination of the aggregate level on the other. There is thus no sharply marked break in the analysis as is so often the case.

Finally the hypothetical examples which are worked out are cast in a framework which, it seems to me, tends to offer the student a better background for understanding both the nature of and the limitations to modern empirical analysis. As an outstanding example, discussion of the linear model in Chapter I is accompanied by a fold-in input-output table for a hypothetical twenty-industry economy.

This is not to say that Cameron's ideas are all entirely beyond dispute. For example, I am disposed to quarrel with his practice of including a "normal rate of profit" in the early models where there is no investment, and of stating

it, even in later chapters, as a per cent of output. Nor does his reference to holding money as a "hedge" strike me as a happy use of the term. But it would be a drab book indeed which failed to offer some occasion for difference with the author.

Brevity of presentation is not achieved without cost. Although one does not have the feeling that the style is unduly terse, the book may not prove to be an easy one for the average student to master without considerable guidance. Nevertheless, the volume will provide an excellent text in a senior or first graduate course in economic theory for the instructor who prefers a brief, competent starting place for his own elaboration.

DANIEL B. SUITS

University of Michigan

Economics. By RICHARD C. BERNHARD. (Boston: D. C. Heath. 1954. Pp. xiv, 801. $6.00.)

For the aim of this principles textbook this reviewer has nothing but praise. The author has paid more than lip service to the ideal of presenting economics to the beginning student as a part of the larger field of the social sciences and, indeed, of the whole body of man's knowledge. It is refreshing to find an economist who, on a single page, can make meaningful references to the works of Whitehead in philosophy, Wigmore in law, Born, Oppenheimer, and Planck in physics, Pareto and J. N. Keynes in economics (p. 715). The author's short note (pp. 236-37) on ". . . current literature in which unemployment is a background or setting. . . ." fills a need which many principles teachers must have felt when trying to bring home the broader effects of depression to present-day students who have no personal recollection of the nineteen-thirties. Unemployment and national income statistics and price indices are hardly adequate to give the picture of that era for today's college sophomore. The perceptive novelist has a very real contribution to make.

When we turn to the technical analysis there are some disappointments. Micro-economics receives a full treatment. Demand analysis is, however, based on diminishing marginal utility rather than indifference curves—a deliberate choice made for pedagogical reasons. Part of the analysis, particularly that of elasticity of demand, is carried beyond the level of difficulty with which the average sophomore can successfully grapple.

Macro-theory, however, does not appear to receive the space or rigorous analysis which it deserves in view of its position in modern economic thought and its importance for national policy. I hasten to add that the author does not slight it because he believes, as some do, that if we ignore Keynesian economics it will go away. (His apt characterization of Henry Hazlitt's ideas on depressions is that they are "antediluvian.") His statement that, "The problems of economic fluctuations are now stated in terms that are more satisfactory [than saving and investment] and the explanation is supplemented by the concept of saving and investment" (p. 281) needs elaboration and substantiation. Many economists would not agree that Lutz' article in the *Quarterly Journal of Economics* (Aug. 1938) is "definitive," in this regard.

The chapter on "Economic Myths and Superstitions on the Subject of Depressions" is a worth-while and stimulating innovation.

Emphasis upon and space allocation for institutional material in principles textbooks are to a considerable degree matters of taste. This book gives a very full treatment of business, labor, and international institutions. The omission of agriculture is unfortunate, however, for this field is not only a controversial one with regard to policy, but also offers the student an opportunity to use some of the analytical tools he has learned earlier in the course. Considerably more attention is paid to the relation of economics to law and to statistics than in most beginning texts. There is also fuller treatment of a war economy—the stepchild of economics—than is generally found.

This text is elaborately footnoted, which is ordinarily pedantic pretense in a principles text since few students will read footnotes and the instructor presumably is familiar with the literature. But in this work many of the footnotes serve a very useful purpose in directing the ambitious student and his instructor to materials outside the field of professional economics which can be studied with pleasure and profit by both.

Economics can be recommended without reservations for the beginning course. It is, perhaps, best suited for those principles courses which are oriented towards students not majoring in economics or business administration.

ROYALL BRANDIS

University of Illinois

Economic History; National Economies; Economic Development

Britain and Industrial Europe, 1750-1870: Studies in British Influence on the Industrial Revolution in Western Europe. By W. O. HENDERSON. (Liverpool: The University Press. 1954. Pp. vii, 255. 25*s*.)

The appearance of a new work which stresses the international aspects of the origins of industrialization in Western Europe is a welcome occurrence, not alone for economic historians, but also for scholars and officials whose concern is with that most recently sprouted of the branches of economic science and policy—the economics of underdeveloped areas. Dr. Henderson, senior lecturer in international economic history at the University of Manchester, is well qualified to deal with this topic in view of his previous work on *The Lancashire Cotton Famine, 1860-5* (1934) and *The Zollverein* (1939), as well as his many articles dealing with the economic expansion of Germany. Although he makes no pretense of writing a complete history of British influence on continental industrial development, he has dug deeply and skillfully into a wide variety of sources, both manuscript and published, to bring to light much new information and to correct some old misinformation. His use of contemporary literature and reports of government commissions is particularly noteworthy.

In an introductory chapter the author states that Englishmen influenced the industrial development of Western Europe in three ways: (1) emigration of

skilled workmen who installed new machinery and instructed native workers in its use; (2) the activities of British entrepreneurs and managers abroad; and (3) the export of British capital. In addition, he points out the significance of continental industrialists who studied or traveled in Britain. In the chapters which follow he is primarily concerned with the first two instrumentalities; his book is, therefore, a useful complement to Leland Jenks' *Migration of British Capital to 1875* (1927), which thus far has stood virtually alone in its treatment of this topic.

The main body of the work consists of eight monographic studies (some previously published) on aspects of the development of France, Belgium, Germany, and "Central Europe" (which in this case consists of the Habsburg dominions, Holland, and Switzerland). Three deal with specific episodes, the others with more general topics such as the textile or metallurgical industries. The studies are grouped by country, France rating three totaling 91 pages, Belgium one of 37 pages, Germany three in 55 pages, and "Central Europe" only 17 pages.

British influence was most pronounced in France and Belgium, considerable in Germany and Switzerland, of much less significance in Holland and the Austrian Empire. Although the author does not explicitly draw the conclusion, it is clear that direct British influence was at its peak between 1830 and 1860. Prior to that time communications were inadequate and social conditions unfavorable for the rapid diffusion of techniques, even after they had once been transplanted. Subsequently, there was a less pressing demand as the once-backward countries, notably Belgium and France, themselves began to export the instruments and techniques of modern industrial enterprise.

Incidental reference is made to the activities of British workers and entrepreneurs in Spain, the Scandinavian countries, and Russia. There is, however, no mention in the text of either Italy or Portugal, although British influence in the former in the middle decades of the nineteenth century was enormous, and the latter was virtually an economic satellite of Britain. Although Portugal, certainly, was not a part of "industrial" Europe, the omission of Italy is a serious gap. In another connection, had the author paid more attention to the activities of financial institutions and the export of capital he would have found still further evidence of British influence; for example, in the early Swiss railways before they were taken over by French and native Swiss entrepreneurs. On the whole, however, he is correct in placing the emphasis on men, machines, and techniques; the export of capital was of importance mainly as a vehicle for the former. In the instances when capital went abroad unaccompanied, as in government loans, it turned out more often than not to have been of little effectiveness in promoting industrialization.

Most readers will applaud the brevity of the volume, as well as its precise scholarship, but there are a few trivial defects of composition which mar its readability. Much material which belongs in the text is to be found in the voluminous footnotes, and in places the text itself tends to resemble a catalog, as when the author reels off the names of English artisans in a particular locality. Also, the nature of the individual studies results in some repetition.

On the other hand, the elaborate footnotes, the well-chosen titles in the 17-page select bibliography, and the very thorough index will all be of considerable value to scholars working in this and related areas. And for a wider audience, the nature and consequences of the diffusion of techniques of economic development which Henderson has illuminated in this instance will invite comparison with similar phenomena of both past and present.

RONDO E. CAMERON

University of Wisconsin

South African Food and Agriculture in World War II. By J. M. TINLEY. (Stanford: Stanford University Press. 1954. Pp. xii, 138. $5.00.)

This is one of the group of studies sponsored by the Food Research Institute on food and agriculture in World War II. It reviews briefly the prewar position of South African agriculture, describes the evolution of the food and agriculture regulatory agencies during the war, and tells what was done to handle the surpluses of some export products, resulting from the loss of markets in enemy countries or from the lack of shipping, and to meet the shortages of other products due to increased consumption, unfavorable weather conditions or absence of the usual imports. The book goes on to discuss the wartime difficulties encountered, and the measures taken to meet them, in fertilizers and other farming requisites, the wartime employment and food consumption trends, price control and price developments, and the postwar food problems. The final chapter provides a good summary of the book.

One item of particular interest is that South Africa never introduced a formal system of food rationing even though there were periodic shortages of certain foods, especially immediately after the war. The determining factor in this policy was the government's belief that the administration of food rationing in the South African multiracial and culturally heterogeneous economy would be most difficult. The author flatly disagrees with the policy that was followed, stating that difficulties would have been no greater in South Africa than in many other countries. In this regard, my sympathies are with the government.

Strangely, although Professor Tinley is the author of a book on the native labor problem in South Africa, the introductory background section of the book omits any mention of one of the important characteristics of South African agriculture: the dependence on African natives for the bulk of the labor on the European farms. Unless this particular organization of production is appreciated, the low productivity of South African agriculture cannot be understood.

Within the framework that the author accepted for himself he did an excellent job in providing a concise clear description and analysis of what was done in South African food and agriculture during the war. But those readers who are interested in the major problems of South African agriculture, or in the economy of South Africa and the position of the food and agricultural sector within the economy will feel dissatisfied.

The book omits any analysis of the lasting impact of the war on South

African agriculture. For example, what did the war do to the peculiar economic structure of agricultural production? There is no mention made of the contribution of the war towards the elimination of the "poor whites" from agriculture, nor, on the other side, of its contribution towards the spread of the Karoo—the South African semidesert.

A White Paper on agricultural policy issued at the end of the war stated, "Today the farming industry and the country generally are suffering from the results of systems of land use that have been carried on with apparent success as far as production is concerned, over lengthy periods of time, but which are now showing clear signs of breakdown all over the country." "Breakdown" is undoubtedly too harsh a characterization of South African agriculture at the end of the war, but it is fairly clear that South African agriculture responded poorly to the challenge of the war. There is no doubt that Tinley's book would have been more illuminating if it had included an analysis of this problem.

A. M. KAMARCK

Chevy Chase, Maryland

Management of the Industrial Firm in the USSR: A Study in Soviet Economic Planning. By DAVID GRANICK. (New York: Columbia University Press. 1954. Pp. xiii, 346. $5.00.)

This is the fourth in a series of books on the Soviet Union to be published by the Russian Institute of Columbia University. It is the first major work on Soviet industrial management to be published in the West and is based on a study of heavy industry for the period 1934-1941; it extends our knowledge considerably beyond the point to which it was carried in 1944 by Bienstock, Schwartz, and Yugow (*Management in Russian Industry and Agriculture*). It treats many features of the Soviet firm not covered in J. Berliner's recent article (*Quarterly Journal of Economics*, August 1952) nor by A. Vucinich (*Soviet Economic Institutions*, Stanford, 1952), and also corroborates Berliner in those important areas (*e.g.*, the relative unimportance of enterprise profits to managerial motivation) where the studies overlap. Corroboration in this instance serves an important function since Berliner, relying primarily on interviews with displaced persons who held managerial positions under the Soviets, had turned up a considerable amount of information concerning the operation of Soviet enterprises which was at odds with the official picture painted by Soviet economists in their textbook literature and in the more general economic journals. This picture, incidentally, has been accepted by most western economists (see, for example, the writings of H. E. Ronimois). Granick, exploiting relatively untapped sources of data, primarily the Soviet industrial journals and newspapers, but also the financial, political, and legal journals, substantiates Berliner.

The first three chapters of *Management of the Industrial Firm in the USSR* provide background and are "intended to describe the organizational milieu in which management has functioned and the personal traits of the managers which have conditioned their reactions to the Soviet industrial environment."

Chapters 4 and 5 deal with the formation and limitations of the national plans and the role of plant management in their formulation. Chapters 6 through 8 are concerned with the interrelationship between centralized direction of individual plants (and the network of controls employed to this end) and the degree of autonomy of plant management. Chapters 9 and 10 deal with the various (often conflicting) methods by which the success with which a plant has been operated is measured in the Soviet Union. In Chapter 11 some additional material on the penalties and incentives of plant executives is presented. Chapters 12 and 13 "deal with the role of the Communist Party and of mass worker participation in the administration of industrial firms." In the final chapter "an analysis of Soviet firms is made by comparing Soviet industrial organization with Max Weber's model of bureaucratic structure, and some conclusions are offered as to the success of the system in carrying out the ends of Soviet top leadership."

The picture of the Soviet "firm" which emerges from Granick's pen is not a simple one by any means. Indeed it is so complex, and its component forces so difficult to assess, that Granick has made no attempt to develop a theory of the Soviet firm, a shortcoming of his book from the point of view of the economist. But the picture is clearly drawn and is the most realistic available at this date. We see the Soviet enterprise as the basic element in the Soviet industrial-administrative hierarchy. Although enterprise management has the power to make a number of independent decisions, there is no way of predicting which among several possible courses of action will be followed, although some probabilities are implied. Difficulties in predicting enterprise behavior are caused by the fact that Soviet management is faced with a mass of conflicting goals, controls, authorities, penalties and incentives: national goals and priorities conflict with enterprise targets; enterprise targets, of which there are many, are inconsistent with one another so that fulfillment of one involves nonfulfillment of others; the chief bookkeeper is interested in one set of targets, the plant director in another, and the Communist party representative in still another; fulfillment of enterprise goals, which have the force of law, may only be possible by law infringement in some other area; management may be punished for infringing laws to fulfill goals, for not fulfilling goals in fear of infringing other laws, and rewarded for fulfilling goals by infringing other laws; and so forth. In his final chapter Granick fairly satisfactorily explains on rational grounds why such a hodgepodge exists and particularly why the Soviets apply not one but several and conflicting criteria of success to plant management. He might have included in his discussion nonrational factors such as the arbitrary nature of much of the Soviet price system and the problems which arose from the use of 1926-27 prices in industrial planning. He correctly, in my opinion, cautions the reader (pp. 282-83) not to jump to conclusions regarding the relative efficiencies of the Soviet and capitalist economies on the basis of his discussion, and indicates briefly some of the weaknesses from a national welfare point of view of the "rate of return" as the single capitalist criterion of success.

Although Granick carefully refrains from empirical generalizations based

on insufficient data, a temptation in case studies of this sort, I would question his suggestion (pp. 73-74) that imperfections in Soviet planning have resulted in such large amounts of idle capacity as to explain the Soviet policy of encouraging overfulfillment of plans. In fact, Granick himself contradicts this position later in the book (pp. 130-31) in discussing the general Soviet policy of "overambitious" plans.

This is an interesting and scholarly study worth the attention of all persons interested in the Soviet economy, theory of the firm, economic planning, and in the administrative problems of industrial management.

F. D. HOLZMAN

University of Washington

Economic Survey of Europe in 1953. By the Research and Planning Division, United Nations Economic Commission for Europe. (New York: Columbia University Press. 1954. Pp. xii, 314. $2.50.)

In this latest of a series of annual reports on the European economy, the research staff of the Economic Commission for Europe turns its attention to problems of economic development in Southern Europe, an area defined as including Portugal, Spain, Southern Italy, Yugoslavia, Greece, and Turkey. It will come as no surprise to economists who are familiar with previous reports in this series to learn that this is a highly rewarding survey, distinguished both for the richness of its factual material and the acuteness of the analysis.

This survey is a valuable corrective to the easy tendency to lump these countries in with the countries of Western and Northern Europe and to attribute to them all, at least inferentially, broadly similar economic characteristics and problems. In fact, the economies of the Southern European countries reveal easily as many similarities to the Asiatic stereotype of the underdeveloped country as they do to the advanced economies of Western and Northern Europe. Populations are predominantly agricultural; rural underemployment is widespread; illiteracy is common and infant mortality high; cropping practices are inefficient and crop yields low; rural inertia and traditionalism stand in the way of change; mineral exploration and research are retarded; and manufacturing activity is at a low level with its development hampered by the poverty of consumers, the scarcity of skilled labor, the inadequacy of community services, and the low level of savings.

For each of the five countries and Southern Italy, the report offers a critical survey of economic conditions, trends, and policies. The essay on Yugoslavia is of interest not only as a survey of that country's economic outlook, but even more as an account of the emergence in Yugoslavia of a hybrid form of economic organization which would seem to be unique in the modern world. After the break with the Cominform in 1948, the Yugoslav government stopped trying to model its economic system in the image of the Soviet Union, and began its quest for "a specifically Yugoslav form of socialism." What has gradually emerged might be described as bearing some resemblance to guild socialism, though the analogy is imperfect in important respects. There has apparently been no retreat from the principle of public ownership of non-

agricultural productive facilities, but the whole system of detailed centralized planning of economic activity, as *symbolized by rigid production plans* establishing output goals for each industry, has given way by stages to a kind of quasicompetitive socialism, in which an increasing number of resource-allocation decisions are being made via the market mechanism.

The control of industrial enterprises has been formally vested in the workers; that this control is more than nominal may be inferred from the fact that workers, in considering whether to employ the profits of the enterprise for new investment, for community facilities, or for dividends payable to themselves, often chose dividends. The foreign trade monopoly has been abandoned, and enterprises are free to buy and sell abroad on their own initiative, though within the framework of a complex system of export bounties and import levies. Enterprises are also free to make their own decisions with respect to composition and level of output and selling prices. They may in their own discretion invest or disinvest in durable producers' goods or inventories, and they may finance expansion either by reinvesting profits or borrowing from banks.

A steeply progressive tax on the profits of enterprises was to be dropped in 1954 in favor of a flat-rate profits tax of 50 per cent. Dividend payments were to be brought under control, with the share of profits available for distribution to workers falling sharply as profit increases. The central government had decided to abandon its practice of decreeing minimum capacity utilization ratios for enterprises, and "reliance is to be placed instead on a fiscal stimulus to the maximum utilization of capacity in the form of a new tax on fixed capital"—a decision which suggests that the Yugoslav planners may have allowed their admiration for the price system to run ahead of their mastery of price theory.

Though the Yugoslav government has yielded many of its economic prerogatives to the market, it has by no means abdicated its economic role. Investment programming in the area of "social capital"—power plants and steel mills as well as roads and public buildings—remains a direct responsibility of the government. A turnover tax, levied at different rates on different industries, modifies the verdict of the market on interindustry resource allocation. Though sowing patterns in agriculture are no longer prescribed, and though compulsory deliveries were abandoned in 1952, the state is still the sole buyer of some crops and the biggest buyer of others.

The ECE staff wisely refrains from attempting even a tentative appraisal of the results of the new economic policy in Yugoslavia; for not only is the experiment too young to allow of such an appraisal, but its effects would be extremely difficult to isolate in a troubled economic atmosphere dominated by the forced reorientation of foreign trade patterns after 1948, the internal imbalance caused by the impetuous and grandiose planning decisions of the early years, the droughts of 1950 and 1952, and the dedication of 20 per cent of gross national product to defense. While eschewing an appraisal of results, however, the ECE staff, never celebrated for harboring a blind faith in the workings of the free market, cannot resist the temptation to observe that

"current discussions in Yugoslavia . . . emphasize to an almost exaggerated extent the virtues of market mechanisms as regulators of the allocation of resources." What is exaggerated to ECE might not so appear, however, to other observers; clearly the bizarre turn of economic policy in Yugoslavia calls for a more comprehensive and detailed study than ECE is able to provide in this brief but excellent review.

In addition to the country surveys, the report deals on an area-wide basis with achievements and potentialities in agriculture, mining, and manufacturing, and with the internal and external aspects of the key problems of economic development in Southern Europe. The ECE group emphasizes, as potentially remediable causes of agricultural inefficiency in Southern Europe, the traditional but wasteful practice in grain cultivation of fallowing every second year, the antiquated methods employed on latifundia in Portugal, Spain, and Southern Italy, the deforestation and overgrazing of mountain areas, and "the farming of dispersed plots by peasants living in huge townships far away from the land they cultivate." Wheat yields in the area could, according to ECE, be raised by 50 per cent by abandoning the practice of fallowing and substituting an intensive rotation of wheat with fodder plants and special grasses. It is held also that the agricultural potential of certain regions cannot be realized without "breaking up latifundia" and instituting settlement schemes for farmers and farm laborers now living in the vast agricultural villages.

Apart from the special survey of Southern Europe, the report includes the customary review of economic conditions in Western Europe. Despite the preponderance of favorable developments in 1953, including the recovery from the 1952 recession, the improvement in the balance of payments with the dollar area, and the relaxation of strains on the European Payments Union, ECE continues to find symptoms of latent afflictions which belie the apparent good health of the patient. The congenital pessimism of ECE notwithstanding, Western Europe is fortunate to have so skilled a diagnostician; for if Western Europe should stage a full and lasting recovery, it will matter little that ECE is the last to herald it.

Finally, the report contains a brief review of developments in Eastern Europe and the Soviet Union. Probably the most notable change in Soviet economic policy in 1953 was the drive to increase agricultural output by reducing reliance on compulsion and providing stronger producer incentives. These measures included the elimination of a large part of the agricultural bureaucracy, increased farm prices, reduction of compulsory delivery quotas, and more favorable tax treatment of the private allotments of collective farmers. The reforms in agriculture are probably of greater significance than the much-discussed upward revisions of output targets for consumer goods; these prove to be concentrated in the area of metal manufactures, and are of such a magnitude that their realization will apparently not require a diversion of resources presently devoted to capital formation or defense.

Kermit Gordon

Williams College

Economic Survey of Asia and the Far East, 1953. Prepared by the Research and Planning Divisions, Economic Commission for Asia and The Far East, Department of Economic Affairs, United Nations, Bangkok, 1954. (New York: Columbia Univ. Press. 1954. Pp. xiv, 161. $1.50.)

Recent political developments in Asia have so far overshadowed economic trends that the difficult problems of economic adjustment facing most countries of the region have been all but obscured.

Perhaps nowhere else in the world at present is the preoccupation of governments with economic development more pronounced than in South and Southeast Asia. Yet in many countries of the region the immediate problem is that the prospective level of export earnings and of government revenue is hardly sufficient to provide the increasing amount of resources which governments wish to devote to economic development. As a result there has arisen a sharp conflict between the requirements of rapid growth and of monetary stability.

The Korean War boom had enabled most governments to expand substantially the volume of their expenditure, largely for development purposes. With the collapse of the boom and the subsequent decline in export values and government revenues, unwillingness or inability to curtail expenditures to the same extent as revenue fell, has in many cases led to substantial budgetary deficits and economic instability. Many countries of the region face actual or potential balance-of-payment difficulties. The principal cause lies in the decline in export earnings and delays of adjustment in private consumption to lower levels of income, but budgetary deficits are also partly responsible. The foreign exchange earnings and resources of many countries in the area are approximately back at the level they had held before the Korean War started, the gains of the boom having been used up in the subsequent decline.

Some countries have boldly faced up to the problem; for instance, the Philippines has chosen in favor of orthodox monetary and fiscal policies, while Pakistan by contrast is financing economic development through a deliberate policy of repressed inflation. Intermediate solutions have been adopted elsewhere but in many cases current policies are no more than temporary palliatives. Deficit budgets, offset in their inflationary effects by reduction in private investment or by absorption of foreign exchange reserves, have helped in maintaining expenditure, but any large resort to them leads to a chain of unfortunate consequences, not the least of which is higher export prices, a further drop in exports, greater balance-of-payments difficulties, further depletion of foreign exchange resources, etc.

Such is the dilemma of many Asian governments and such in essence is the kernel of the situation as portrayed by the latest *Economic Survey of Asia and The Far East.* The survey concludes that on the basis of present available resources, and prospects for foreign aid or foreign investment it would be unrealistic to hope for any rapid economic progress since the level of genuine savings for investment is still quite low throughout the region.

In its resolution on the "Economic Situation in Asia," the ninth session of the Economic Commission for Asia and The Far East requested its executive secretary to follow closely the studies arising out of General Assembly resolu-

tions on "Financing of economic development of under-developed countries" and to incorporate in future issues of the annual economic survey the results of inquiries relating to these problems. Accordingly an attempt has been made to focus attention on the development theme in Part I of the *Survey* which consists of four chapters covering regionally, the food position, the export decline, public finance and the process of adjustment, and problems and policies of development. For the first time, Part II—by far the larger portion of the *Survey*—gives an analysis of recent economic developments by countries, for each of the individual countries of the region.

This new arrangement of the *Survey* is a much happier one than the unfortunate attempt in earlier years to devote one chapter to each functional topic. The old arrangement often resulted in forced and unnatural comparisons and contrasts from country to country. The new procedure of highlighting the most significant trends and developments with a penetrating and perceptive regional analysis and then presenting rounded and comprehensive individual countries studies, seems to this reviewer a vast improvement over the old practice. This annual survey is a far more useful and readable document than its predecessors.

JEROME B. COHEN

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The Future of Underdeveloped Countries. By EUGENE STALEY. (New York: Council On Foreign Relations and Harper and Bros. 1954. Pp. xi, 394. $5.00).

In writing this book Dr. Staley received advice, criticism, and suggestions from a Council on Foreign Relations study group on "The Political Implications of Economic Development." It is to be regretted that this was not chosen as the title of the book—rather than as its subtitle—for it accurately indicates the author's major interest.

Economists who have made an effort to keep abreast of the literature on the various economic aspects of the problems of growth in the underdeveloped areas will find little that is new here in the narrow field of economic analysis. But most of those who have thought on these problems will agree with Staley that economic development is also a massive problem in social and political readjustment and that this country's concern over it is in large part political. This book, therefore, can be mildly recommended to economists, for they will find parts of it imaginative, discerning, and perceptive, as to the internal and international political and social consequences *and* requisites of a concerted effort to "modernize" the economies of those many areas characterized by chronic mass poverty and obsolete methods of production. The breadth of Staley's concern can be indicated by noting that for him "successful development" includes not merely higher levels of real income, widely shared, but also progress toward democratic self-government and social relations, less vulnerability to totalitarianism, the growth of attitudes making for a more peaceful world, expanding international trade and investment, and a strengthening of the defense capacities of free peoples against aggression.

Staley first appraises, and finds compelling, the motivations for economic development from the point of view of the to-be-developed country, the United States, and the world community. He then examines the nature of the Communist appeal, tactics, and practices in the underdeveloped areas and finds them evil and potent. Having thus set the problem, he goes on during the last half of the book to explore what he considers to be the key problems—emphasizing the social and political aspects—which must be solved if "successful development" is to be had. Here he considers capital formation only briefly and then only as a social process. Much more attention is given to such issues as agrarian reform, population growth, "social technology," external aid, and—in a nontechnical manner—the question of "rounded" economic development.

Staley makes clear at the outset his conviction that the extreme contrasts which exist today between the modernized West and the poorer areas of the world as to economic welfare, health, education, and political freedom poses a decisive test for Western civilization and that either the benefits enjoyed by those presently favored will be generalized or they will be lost to all as more and more people embrace Communism. As this suggests, he writes as a man with an extremely urgent message and the book is shot through with value judgments and such words as "good," "bad," and "should." The matters discussed are so complex that often there is not space for a thorough statement of the supporting evidence and analysis and many of the judgments and generalizations must be accepted on trust. Let it be said that the author's is a persuasive pen.

Although he specifically disclaims any such purpose, Staley does set out many of the elements of an "action" program. The final chapter is entitled "Guidelines for United States Policy" and this reviewer often had the feeling he was reading carefully prepared statements for presentation before, say, an important Congressional committee.

This is no uncritical marshalling of only those arguments supporting the case for bigger and better Point Four programs. Staley does not attempt to minimize the difficulties and uncertainties facing attempts by the West to meet the "revolution of rising expectations" of much of the rest of the world. He does great service by repeating, in various ways, that economic betterment "does not necessarily make nice people" and by emphasizing that the conditions under which increased production will lead to the goals of internal democracy and attitudes that make for peace among nations are complex and delicate, change over time, differ as between areas, and can not be accurately forecast. Many readers will wish that his analysis on these important issues had been somewhat more systematic.

Staley distinguishes himself, among those who write that hastening the economic development of the poorer areas is one of the most important tasks facing us today, by recognizing that in some of the underdeveloped areas the danger is great that population increases may match or outpace production growth, resulting in more rather than fewer people living at the misery margin and leading to disastrous political consequences. He does not despair, however,

and while he concludes that the outlook is highly uncertain, he finds some grounds (not very persuasive to this reviewer) for hoping that birthrates may fall much faster than they have in the past. This is a sobering chapter indeed.

Many parts of this book will doubtless find their way into the official records of the United Nations and the United States Congress by way of statements of those favoring greater efforts by the richer countries of the world to help the poorer nations improve their material well-being. A great disservice will be done Staley if such use of his book fails to make clear his convictions that the process of economic growth must be accompanied by great changes in political and social as well as economic structures, that such changes must inevitably be difficult and painful to many and may be in frightening directions, that disappointments are inevitable, and that while the help given by outsiders may well be the difference between success and failure, most of the burden must be borne by local people.

GARDNER PATTERSON

Princeton University

Western Enterprise in Far Eastern Economic Development—China and Japan. By G. C. ALLEN and A. G. DONNITHORNE. (New York: Macmillan. London: George Allen & Unwin Ltd. 1954. Pp. 292. $4.50.)

The authors have set themselves to describe in some detail the history of western enterprise in China and Japan during the last century. Partly, it is a story of the fortunes and misfortunes resulting from government policies and social upheaval in both countries; partly it tells about the impact of western trade, managerial ability and capital investment on societies in transition.

The book is strictly historical, yet it seems strangely contemporaneous. The necessity of foreign contact, in a mixture of fear and expectation on both sides, is very familiar in our days. Had the authors laid more emphasis on technical assistance and foreign advisers, the picture would have been complete—a century of success and failure in stimulating economic development.

The countries started their development around the middle of the last century seemingly under similar cultural, social and economic conditions; yet the development has been completely different. It is the divergence, not the similarity which came strikingly to light in this study. The evaluation of these differences, and the reasons why they occurred, form the most important part of the study. It contains a lesson, a warning against premature generalization.

If there are two patterns, China and Japan, why would there not be five or six patterns of economic development under the impact of western enterprise? We are promised that Malaya and Indonesia are the subject of a parallel study and should look out for at least one more pattern there.

Yet is it tempting to highlight the differences between Japan and China. Largely, these prove to be cultural and organizational. China was complacent and self-sufficient, Japan eager to absorb western dynamics. Only a society

on the move can absorb the impact of a more rapidly moving force without a clash, even though with friction. The Chinese government became more and more disorganized and weak; Japan more determined and strong, perhaps largely because its education had, in the half century before, been much more forward-looking, less classical than the Chinese. Japan bought foreign services; China had to admit foreign bodies but had no control. Significantly, Japanese industry started with a great deal of government direction and participation. Well-designed, this prevented much dissipation of scarce resources. Most likely also, an archipelago like Japan could, in the nineteenth century, be developed with infinitely less social overhead capital than continental China.

What strikes also, is the eagerness, the variety and perseverance of western private trade and industrial enterprise in the second half of the nineteenth century. At least partly, this was based upon a firm belief in western technical and military superiority. Partly, also, it was possible because the unit of enterprise was still much smaller, and foreign settlements were much more manageable. But there must also have been the courage to take risks, a desire to broaden the horizon and capture foreign markets, which are often missing nowadays. As a result, two underdeveloped countries invoked or at least accepted more foreign technicians, management and capital, over a longer period of time than generally is envisaged under present schemes. Most of it was private enterprise, but governments played an important role.

With all its qualities, the reader misses, in the light of after-World War II attempts to accelerate economic development, a picture of the organizational and economic interrelationships between foreign shipping, trade, financing, insurance, industry, public utilities and their influence, as a package, on domestic economy; stimulating some lines of production, hampering some others, giving jobs to some, making others jobless. There is a detailed description of each part of western activity but hardly a synthesis. The inclination to give qualitative rather than quantitive information gave rise to an enumeration of details which are hard to tie together. Perhaps there are not enough statistical data to show, *e.g.*, what percentage of foreign trade or of commercial banking was in foreign hands, and how this percentage changed over time. However, the study makes abundantly clear that the economic and social history of so-called underdeveloped countries over the last century or centuries, written with a view to modern problems of acculturation, is extremely valuable.

EGBERT DEVRIES

Washington, D.C.

Mobilization of Domestic Capital: Report and Documents of the Second Working Party of Experts. United Nations. Economic Commission for Asia and the Far East. (New York: Columbia Univ. Press. 1953. Pp. 334. $2.50.)

In September 1952 a working party of experts met at Bangkok, Thailand to discuss methods of stimulating the flow of domestic capital for development of Asian economies. Sponsored by the Economic Commission for Asia and the

Far East, the meeting was attended by government representatives from 16 countries, including several delegations from highly developed countries. Discussion was limited to three major areas; this volume is a summary of 34 papers read on these three subjects.

Mobilization of Domestic Capital. In most of the Asian countries discussed, moderate progress has been made the past few years in increasing institutional savings. Unfortunately, data are not available on private noninstitutional saving nor on reinvestment of earnings in unincorporated businesses, which are certainly major sources of saving in Asia. Several novel methods of stimulating savings have been tried in Japan and Korea. Uninscribed time deposits with banks enable savers to remain anonymous thus stimulating savings needed for nation building, using escape from the "net worth" tax as an incentive! In Korea time deposits can be made without benefit of interest, but a lucky few, on the basis of a lottery, are paid handsomely.

In most of these countries government saving is a significant part of total saving. Such saving is also convenient in that it can be easily directed toward nation building projects. Though this saving on government account is an important part of *known* saving, it is a less important portion of *total* saving since a large part of private saving is an unknown quantity in Asia.

Industrial and Agricultural Finance and Development Corporations. The finance corporation is primarily concerned with long-term capital loans, while the development corporation furnishes equity capital and assumes responsibilities of fostering and managing new enterprises. Of 25 country-wide institutions discussed in Asian countries, only 5 are of the development type. These institutions are designed to supplement the private capital market, but in some countries this market is so disorganized that the government corporation finds itself doing a large part of the total financing, particularly in the agricultural field. Success of present finance and development corporations has been substantial but not spectacular. Though capital is scarce, some areas seem to be absorbing capital as rapidly as they well can under existing conditions. Several finance institutions of the area report safe investment opportunities limited by the shortage of enterpreneurial judgment and management skill.

The Relation Between Foreign Capital and the Mobilization of Domestic Capital. Three of these papers are theoretical, and one by the ECAFE Secretariat is noteworthy in that it endeavors to set up a simple model by which underdeveloped countries can estimate foreign capital requirements for given investment programs. It is pointed out that most development plans in Asia have estimated foreign capital requirements ignoring induced imports which will result from increased income, and thus underestimated foreign capital needs and misjudged inflationary pressures. The ECAFE Secretariat has done well in making clear to responsible fiscal officials of the various countries the necessity of a theoretical framework in estimating foreign capital requirements for development programs.

Unfortunately, one error runs throughout the discussion (see mathematical appendix, pp. 285-90): *any* income increase is interpreted as inflation, thus

ignoring the effect of any possible increase in productive capacity, with the result that increased income can only mean higher prices. The model chosen incorporates no capital function, so that the beneficial effect of the development program is precluded from becoming apparent in the model. This is a serious error, and a surprising one to find in a conference devoted to capital-development programs. Implicitly, full employment is assumed throughout, which is a dubious assumption in these areas of recognized underemployment.

General comment can hardly do justice to such a collection of papers. It brings together much information found elsewhere only with great difficulty. The United Nations is performing a signal service in publishing reports of such working parties thus making them available to scholars and public officials. I venture, however, that the most important discussions of such conferences never get into the report, and the reader thus feels unsatisfied. Summary reports of the discussion following each paper would breathe life and vitality into what occasionally borders on the dull.

WILLIS D. WEATHERFORD

Swarthmore College

Measurement of Productivity in Indian Industry. By R. BALAKRISHNA. (Madras: University of Madras. 1953. Pp. vii. 288. Rs. 15.)

In this study the author attempts to measure over-all productivity in Indian industry compared with the prewar situation, and to establish interregional and interindustrial comparisons of productivity. The basis on which productivity is measured is chiefly the man-hour requirement per unit of output. The approach is different from typical industry case studies in which productivity is assessed by a thorough analysis of many factors involved. The task of this author was certainly made difficult by lack of data.

The first finding of the book is that there was a decline of more than 10 per cent in labor productivity in India in 1948 as compared with 1938. Twelve industries were examined which represented about 77.56 per cent of the total man-hours worked, and 77.45 per cent of the total ex-factory value of products and by-products of the 29 industries under the 1948 Census. As no census of manufactures existed in 1938 the author had to work on various assumptions, particularly with regard to the manpower requirements in 1938. According to his calculations the unit labor requirement index for 1948 is 111.28 (1938 = 100) and the index for total labor required to produce the current complex of goods with the unit labor requirements of the base period is 109.54 (1938 = 100).

Assuming that the author was successful in the various calculations in spite of the scarcity of data, it is doubtful whether the year 1948 should be used to compare the productivity of Indian industry with the prewar period. As the author himself points out, other important factors than labor productivity must be considered: there was hardly any replacement or modernization of equipment in the postwar years; the import of raw materials was irregular; the supply of electric power was often interrupted, and transport difficulties caused artificial scarcities of materials. All these factors, plus the inflationary

trend, were not conducive to an improvement in productivity. Even in various industrialized nations, productivity in the postwar years was lower than in the prewar period. Therefore, it would be very instructive to compare data for 1953 with 1938 and 1948. The more recent data would certainly supply a better basis for an assessment of productivity of Indian industry.

With regard to interregional productivity, twenty-four industries were examined. Productivity in the states with the greatest concentration of industries—Bombay and West Bengal—is about 8 per cent higher than in the rest of India. The reasons for that can be found in external economies and large-scale operations.

Balakrishna tried to compare productivity in various industries. He arrived at the conclusion that the disparity in productivity—in some cases very substantial—does not seem fully warranted by the differences in the capital equipment of the workers. Capital intensity in fact does not seem to offer any evidence for the differences in productivity. There also appears to be very little correlation between shifts in economic activity and productivity; perhaps profitability has been a more potent factor generating shifts in industry than productivity.

In the second part of the book the author analyzed most of India's industries and endeavored to provide data on output per man-hour, on capital equipment and kilowatt-hours per worker. Substantial differences are shown between the man-hours required in the same industry in various parts of India. The author also attempted to compare labor productivity over a period of time in cases where information was available. With the exception of the cement and match industries all industries show a decline in labor productivity. Again, the years taken as a basis for comparison cannot be considered normal.

Only in one industry, the cotton textiles, is an attempt made to compare productivity in India with that in other countries. The output of yarn per operative in India in 1947 was about 28 per cent of the output in the United Kingdom in 1937 and in Japan in 1933; the output of cloth per operative in 1947 was about one-half of that in the United Kingdom in 1937, and only about 30 per cent of the output in Japan in 1933. It would have been very useful to have similar comparisons for the steel and jute industries.

One finding which is common to most industries is very important. According to the author, a positive relation between capital equipment per worker and physical output per man-hour should be regarded as an exception. This may be a very important aspect of the structure of Indian industry. India has been known as the country of cheap and abundant labor and, for instance, its cotton textile industry has succeeded in expanding substantially its exports against industries with higher productivity of labor. At present, however, India is faced with new problems. It must develop new industries to provide employment for its growing population and must improve productivity of the existing industries. There is a strong tendency to protect the not very efficient cottage industry (for example, in cotton textiles) and to prevent reduction of the labor force which would result from the needed modernization. Production

costs are becoming more rigid. Furthermore, labor, now better organized and more influential than before the war, is pressing for higher wages, better housing, social security and other benefits. If labor productivity does not increase, India may cease to be a country of cheap labor. The problem cannot be solved, as the author suggests, by aiming "at economic development rather than at competitive efficiency." It is necessary to work out a policy suitable to the conditions of India which would make possible an increase in both production and productivity. Case studies on all major industries are needed which, together with other information, could serve as a basis for the government's industrial policy.

This book, which provides a wealth of information and in some instances offers recommendations as to policy, can be considered only as a beginning of the work to be done.

ANTONIN BASCH

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Statistics and Econometrics

Business and Economic Statistics. By WILLIAM A. SPURR, LESTER S. KELLOGG, and JOHN H. SMITH. (Homewood, Ill.: Richard D. Irwin, Inc. 1954. Pp. xl, 579. $6.00.)

Any author of a text in elementary statistics for social science students, in addition to facing the usual chores of the textbook writer, finds himself confronted with a most difficult and delicate problem: the determination of content and level of the course for which his book is written. Since there has been less uniformity in the treatment of the introductory statistics course than of most any other part of the undergraduate social science curriculum, the textbook author also becomes, of necessity, a curriculum planner. Planning the curriculum and determining effective ways of providing the social science student with an adequate statistics diet, however, presents serious and controversial problems with which this review is not concerned.

The objective of the course to which the present textbook—a successor to Brumbaugh and Kellogg's *Business Statistics*—addresses itself is suggested by the authors in their preface: a book "designed for basic courses in statistics offered in departments of business, economics, and general social science" with stress on "practical business and economic problems rather than on theory, mathematical derivations, or statistical techniques as such . . . Basic English is used as far as possible in place of the polysyllabic jargon so common in technical publications, and the use of symbols and mathematical formulas is kept to a minimum."

Within the framework of these objectives the authors have presented a remarkably clear and simply written text. The first eight chapters deal with a review of arithmetic manipulations occurring in elementary statistical computations; with a well-documented treatment of sources of economic statistics, amplified by an appendix; with the collection of original data, including a nontechnical discussion of sampling designs and procedures; and with the

construction of tables and charts.

Chapters 9 to 11 discuss empirical frequency distributions and their descriptive measures; Chapters 12 and 13 are given to the construction of index numbers as well as to an up-to-date description of major economic indexes, and Chapters 14 to 16 treat the analysis of economic time-series. These 16 chapters occupy approximately 460 pages. The remaining eighth of the text discusses reliability of statistical measures and statistical quality control. The appendices include, in addition to the already mentioned carefully prepared and annotated listing of sources of economic statistics, the usual set of statistical tables.

The outstanding features of the exposition are its lucidity, its helpful use of well-chosen and timely illustrations, its stress on approximate and graphic methods, and the well-chosen structure and organization of the material, *e.g.*, the early introduction of the survey design problem. As might be expected from a triumvirate of experienced and practicing economic statisticians, the presentation of statistical techniques is successfully woven into the fabric of applications. Throughout the book the student is led from the specific problem to the general statistical recipe. Inasmuch as some might frown at such an approach as not sufficiently dignified, it might be pointed out that the more formalistic approaches in themselves are no guarantee against a "cook-book-like" treatment. The authors of the present text seem to have had this point well in mind, and as this reviewer sees it, perhaps too well.

The book should serve a very useful purpose as a none too technical introduction for students in schools of business administration and in economics departments. However, in view of their approach, as exemplified by the complete absence of any mention of probabilities, the authors' belief that "nevertheless, the treatment is precise enough to meet the needs of those who plan to become professional statisticians" seems, in these times, hardly justified.

J. E. Morton

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National Income and Social Accounting

Realistic Depreciation Policy. A MAPI Study. By George Terborgh. (Chicago: Machinery and Allied Products Institute. 1954. Pp. xxiv, 197. $6.00.)

Discussions of depreciation in economic literature have been concerned primarily with valuation (mainly original cost versus replacement cost). The allocation over time of the sum to be amortized has received less attention. Although the present volume deals with both of these problems, its novel contribution is that it demonstrates the coordinate importance of the latter.

The author believes that the straight-line method, now prevalent in the United States, results in serious underdepreciation, because it does not amortize capital values fast enough. He advocates depreciation charges which decline over the service life of capital goods, and consequently write off a larger proportion of total value in the earlier parts of service life. Although the two methods yield the same result over the entire lifetime of capital goods, the

latter will always result in higher current depreciation charges if the capital stock is expanding.

The assessment of the quantitative importance of the depreciation problem is advanced significantly by articulated estimates of depreciation charges for the U. S. economy under alternative accounting methods. The argument is logical and systematic. Speeded along at crucial points by a healthy ability to cut Gordian theoretical knots, it culminates in a set of practical recommendations for tax policy. The work, it may be added, is a masterpiece of exposition. It can be recommended to all those who take pleasure in craftsmanship.

Only brief comments on the significance of depreciation charges for the functioning of the economy are given (in Chapter 1). Inadequate depreciation is regarded as harmful because it tends to reduce investment by diminishing the supply of investment funds. (This comes about mainly because amounts that should properly be charged to depreciation appear as part of net profits and hence are taxed.) Possible stimulation of investment from the demand side by the concurrent overstatement of profits is not taken into account.

The analysis of depreciation charges in their bearing upon the functioning of the economy involves broad issues, such as the desirability of a high-investment economy and the availability of investment opportunities, which are outside the scope of this book. Earlier writings of the author (especially *The Bogey of Economic Maturity*) should be consulted for a statement of the economic philosophy which underlies his view of depreciation charges.

Highlights in the development of depreciation accounting in the United States, as influenced by the policies of the Internal Revenue Service, are given in Chapters 2 and 3.

The case for depreciation charges which decline over the lifetime of capital goods is established in Chapter 4. The basic reason for such a pattern is the decline in successive annual service values which stems from the mounting impact of wear and tear and obsolescence. The pattern of decline for depreciation charges advocated by the author is more moderate than that implied by the decline in service values, because future service values are discounted in his formula. In other words, service value used up in any one year is partly offset by the fact that future service values grow as they move closer to the present. This tendency is stronger in the earlier parts of service life when the stock of maturing unused service value is relatively large than in later parts of service life when this stock is smaller.

This use of a discount factor raises a problem of theoretical interest. To illustrate it, let us abstract from the influence of annual service values (available for capital recovery and profit, *i.e.*, receipts minus operating expenses other than depreciation) by supposing that they are constant over the lifetime of a capital good. Annual depreciation charges would then be increasing because of the operation of the discount factor, and the net output of the capital good would appear to be declining over its lifetime. To the present reviewer this result is not appealing if the aim is to gauge annual performance. On the other hand, the procedure does secure a constant annual rate of return on the

depreciated value of the investment, which seems reasonable from some other standpoints. By contrast, a calculation of depreciation charges which does not take into account the discount factor would indicate constant net output over the life of the equipment, but would show an increasing rate of return on investment. To this reviewer this presents a dilemma which he has not been able to resolve.

In Chapter 5 the allocation pattern derived in Chapter 4 is confirmed by data on the market values of second-hand durable equipment.

Lags in depreciation, resulting from the dispersion of actual service lives around the expected average on which depreciation quotas are based, are examined in Chapters 6 and 7. These lags are shown (in Chapter 8) to be of secondary importance to the deficiencies stemming from straight-line write-off itself.

Quantification of the deficiencies in depreciation resulting from present allocation methods is provided in Chapters 9 to 11. Estimates of this type are exceedingly difficult to make, because of data gaps; at the same time the work involved is prohibitively time-consuming unless one knows how to take short-cuts. Ingenuity and bold simplifications in procedure (such as the use of a rather simple weighting system for combining the average lives of different types of equipment; and the application of a constant life-dispersion pattern to annual increments of investment irrespective of their composition) enable the author to develop estimates that quantify separately most of the aspects of the problem with which he deals theoretically.

A check on the reasonableness of his results is provided by a comparison of depreciation charges as computed by him, assuming accounting methods now in force, and those actually reported on corporate tax returns. This check is not quite so satisfactory as is suggested by the author, and there appears to be some understatement in his estimates if, in deriving corporate from total computed depreciation, estimates for unincorporated business made by the U. S. Department of Commerce (but not available to the author when he wrote his book) are substituted for those he uses.

In discussing the valuation problem, in Chapter 12, the author pronounces in favor of revaluation to maintain the general purchasing power of depreciation quotas, rather than revaluation to make them sufficient to maintain the real stock of capital. Accordingly he is able to sidestep the difficult problems connected with the concept of keeping capital intact. Others, connected with the definition of general purchasing power (including selection of items, weighting, and quality change) he brushes aside with the remark that he is not after theoretical niceties, but "attempts to secure under conditions of inflation, the same results that conventional depreciation yields under stable conditions" (p. 119). Summary treatment of the major principles involved would be unsatisfactory in theoretical discussion, but is necessary if practical policy is to be formulated.

The extent of the total deficiency in depreciation on United States fixed capital, other than residential property, is summarized at the end of this chapter. Certain key figures are as follows. The current annual deficiency of

depreciation charges amounts to almost $7 billion, or nearly 50 per cent of the total now charged. About two-thirds of this is attributed to incorrect valuation, the remainder to incorrect allocation over service life. Future depreciation quotas on existing equipment are estimated to be deficient by about $70 billion in terms of 1953 purchasing power; and underdepreciation on existing equipment due to the use of deficient allocation methods is put at $30 billion.

In the opinion of the reviewer two major considerations should be kept in mind before these figures are taken as comprehensive measures of the underdepreciation of American productive capital. In the first place, as the author himself notes, no allowance is made for the fact that owing to technical progress depreciation charges tend to be overstated from the standpoint of maintaining productive capacity. A source of overdepreciation, probably huge, although it cannot be quantified, appears if maintenance of capacity is accepted as a criterion. Second, the estimates are based on average service lives specified by the Internal Revenue Service (in its Bulletin F). If service lives used for tax purposes (whether conforming to Bulletin F or not) should differ from actual service lives, there would be an additional source of under- or overdepreciation which is not quantified in the above estimates.

Advantages of depreciation reform are presented in Chapter 13. The total tax gain (due to the purchasing power adjustment for inflation) and the timing gain (due to an accelerated pattern of allocation) are considered, as well as more technical points such as the diminished risk of retirement losses not covered by taxable income.

Concrete proposals for tax reform are formulated in Chapters 14 to 16. The proposed purchasing power correction is a onetime adjustment to raise future depreciation quotas on existing assets to the present price level. A continuous adjustment for future changes in price level is not advocated, presumably because it would be administratively too cumbersome. With respect to allocation, the author advocates the declining balance method, at a rate double the straight-line rate, as a reasonably simple method for approximating the standards of allocation developed earlier in the book.

The immediate revenue loss from the full implementation of these two proposals would be substantial. To ease the transition, the deferral of the purchasing power adjustment is considered, and also a compromise between the straight-line and the double-rate declining balance method for a brief period. The limitation of the latter method to assets installed after a specified date is not favored.

In the final chapter the point is made that gross tax losses from depreciation reform will be offset by tax gains if they result in accelerated economic growth. Calculations are made which show net tax gains beginning about ten years from now. The author warns against a too literal interpretation of these calculations.

George Jaszi

Washington, D.C.

Business Fluctuations; Prices

The Economics of Recession and Revival: An Interpretation of 1937-38. By KENNETH D. ROOSE. (New Haven: Yale University Press. 1954. Pp. xii, 280. $4.00.)

Professor Roose examines the recession of 1937-38, the most rapid in our history, and the revival of 1938, in an effort to test the major explanations that were put forward at the time, to test business cycle theory by empirical means, and to extract from the experience lessons that will be useful in our thinking about business cycles and government stabilization policy. The book is significant mainly, I believe, as an attempt to apply the historical-quantitative method of analysis. Careful analysis of the past offers one method for testing business cycle hypotheses but the analyst's path is beset with pitfalls. For this reason, such analyses need to be carefully examined.

In this case the author warns the reader of the limitations of the method: That hypotheses cannot be proved but only disproved and that where several factors are at work there may be no clear basis for judging their relative importance, so that if the analyst wishes to come to some conclusion he may be forced to rely partly on his "intuitive judgment." Since this judgment is almost certain to consist chiefly of his initial biases, Roose is to be commended for stating his bias explicitly. He also warns the reader when statistical data are lacking or inconsistent and tries to overcome some of these difficulties. Despite these virtues, the result cannot be regarded as a satisfying application of the method. The author sometimes forgets its limitations and those of the data in his desire to draw a conclusion where none seems justified by the evidence; he does not use all the data that are available, fails to consider some important hypotheses that were then or have since been advanced to explain the behavior of private investment in that period, and does not explore the possible relationships between the downturn and the preceding course of events which are suggested by modern dynamic business cycle theory.

After considering, in turn and separately, the causal role of a number of factors, the book concludes that the major causes of the recession were the drastic decline in the government's net contribution to income, which shifted the burden of sustaining income and output to private investment in an environment of depression-consciousness and uncertain expectations; Federal Reserve action, which at the same time increased the costs of capital; the undistributed profits tax which, besides adding to business uncertainty, reduced corporate liquidity; and, most important of all, the reduced profitability of investment beginning in the first quarter of 1937, which resulted from increased costs, including especially labor costs. Major, if not exclusive, credit for stimulating the revival is assigned to the government's spending program. The revival is not exhaustively dealt with, and the rest of this review is therefore confined to the author's analysis of the recession.

The sharp decline in the net government contribution to money income from a peak annual rate of over $5 billion in the middle of 1936 to zero or

a slightly negative figure in the middle of 1937 was clearly a factor in the recession, and the only difficult question, Roose says, is what position it occupies in the list of contributory factors. He concludes that it was not the "primary" cause, mainly because income continued to rise until September 1937, so that the decline in net government expenditure was felt, at most, only "indirectly"; and the lag between the turning points of the net contribution and total economic activity was too long to be accounted for by the time required for most of the multiplier effects to work. He also accepts, as true and inconsistent with a primary role, Slichter's conclusion that the flow of consumer goods did not out-distance consumer purchasing power, and believes that the cut in net contribution was somewhat less drastic than initial consideration of the data might indicate.

His conclusion appears to mean that the cut was not the immediate cause of the downturn or could not have caused it without affecting other elements of national product or expenditure. The data considered serve only to test this rather *simpliste* hypothesis of a direct effect of net contribution upon total activity. The author's reliance upon the time lag for the refutation of the hypothesis is based on acceptance of the view, which I thought had long since been recognized as fallacious, that the time period required for the multiplier to work, which relates to the ratio between *increments* of income and resulting *increments* of *expenditure*, is the same as the average income velocity of money, which relates to the ratio between *total* income and *total money supply*. The more important point is that, on a broader interpretation of the word "cause," the time lag is not a telling argument. The decline of income could have lagged behind the decline of the government net contribution by more than the consumption lag accounts for, if the latter decline had caused production that would otherwise have gone to consumers (and perhaps other final buyers) to go into inventories, thereby giving rise to an unplanned rise in the rate of inventory accumulation. If such a development had occurred while fixed capital expenditures or planned inventory accumulation (or both) were also rising, there would not necessarily have been a downturn in production, consumer income, or consumer expenditures until businessmen cut capital outlays or realized that inventories were accumulating more rapidly than they desired and reduced their orders. The timing of the downturn need have borne no close or direct relation to the timing of the decline in the government's net contribution. It may be only a matter of words whether one says that the downturn was "directly" caused by the decline in the net contribution or that it was "directly" caused by the decline in the rate of inventory accumulation. But since inventory accumulation above the desired rate would be caused, in this hypothetical case, by the curtailment of the government's net contribution, it would seem a normal use of language to say that the cut in the government's net contribution was a major cause, whether direct or indirect, of the downturn. My impression is that something like this may have been an element in what happened in 1936 and 1937. This hypothesis is not refuted at this point in the author's analysis or in the later discussion of inventories.

The author then turns to the Federal Reserve Board's actions in raising margin requirements on securities in February 1936, raising reserve requirements by 50 per cent in August 1936 and by another one-third in a two-step action in the first half of 1937, and the Treasury's gold sterilization action, begun in December 1936, which prevented incoming gold from increasing member bank reserves. The Board continued to advocate an easy money policy, professing to see no reason why its actions should affect this policy. Roose concludes that the Board's actions, especially in the spring of 1937, played a significant role in precipitating the recession, taking issue with Hardy, Schumpeter, Wilson, Slichter, and many others. These actions, clearly, raised the yield on short-term government issues and in all sectors of the bond market. Roose thinks that this rise of yields also led to the subsequent weakening of the stock market and made it harder to get new capital funds. Against Schumpeter's objection that "no business calculation can in practice be affected by so minute an increase" in interest rates, Roose surmises, on the basis of the rise in yields on common stocks, that the rise in costs of new capital for the average company may have been at least one-third, even though yields on *Baa* bonds rose only 10 per cent.

The analysis of credit policy appears sound as far as it goes but one misses an examination of its effects on residential construction and the relation between security issues and capital outlays. In appraising the monetary policies, Roose points out that restrictive measures were inappropriate when a substantial volume of resources was unemployed. He might also have pointed out that it was confusion to suppose that member bank reserves were "excess" in an economic sense merely because they were excess in a legal sense. Because inability to wipe out excess reserves (in the legal sense) does not necessarily imply inability to restrict credit, it was an error of analysis and policy for the monetary authorities to attach overriding significance to the *relation* between the government security holdings and the volume of excess reserves.

The role of price-cost relationships is examined to see whether a rise in prices relative to the wage element in costs reduced consumer demand by shifting the distribution of real income against wage earners, as some claimed, and whether a rise of costs relative to prices reduced investment by cutting profit margins, as others claimed. That a rise in prices relative to costs cut consumption in relation to income seems unlikely to the author. This conclusion rests mainly on the later examination of the view that the downturn resulted from a "failure" of consumption expenditure, meaning by this not an actual fall or a mere reduction in the rate of increase, but rather a decline in the relation of consumption to national income, while national income was still rising. Warning the reader of lack of comparability, gaps, and inconsistencies in the available statistical data, the author concludes that the recession was not due to a failure of consumption expenditure because consumer income kept up with production of consumer goods and consumer expenditure kept up with consumer income. The data he uses, however, show that production of these goods rose more than both deflated consumer income and expenditure between the 1st and 4th quarters of 1936 and fell by less than consumer

expenditure between the 4th quarter of 1936 and the 2nd quarter of 1937. The conclusion thus appears to rest heavily upon the fact that between the 2nd and 3rd quarters of 1937 the production of consumer goods declined very slightly (0.6 per cent) while deflation of Barger's series show increases of 6½ per cent for both consumer income and expenditure and the Department of Commerce series for consumer expenditure (not deflated) reached a peak in September 1937. These data lead Roose to the conclusion that the recession was not immediately preceded by a decline in the consumption function or in the marginal propensity to consume.

The main difficulty in the treatment of consumption is the failure to state clearly what hypothesis is being tested. Consumer goods output and consumer income are compared but it is not clear to what this is relevant. A direct comparison of consumer goods output with consumer expenditure on goods alone would be relevant to the inventory situation, but the author makes no such comparison. A comparison of consumer income and expenditure is only one element in the relation between consumption and total output. A comparison of consumer income with *total* output would be relevant to the other element in the relation between consumption and gross national product, but that he also foregoes. If the hypothesis being tested is that consumption stopped rising, the refutation is questionable because it is based on the rise of Barger's consumption series between the 2nd and 3rd quarters of 1937. Roose gives no evidence of having noticed Barger's warning that his quarterly figures for consumption of perishables include changes in distributive inventories.[1] While Barger's series rises 7 per cent between these two quarters, the Department of Commerce series for total consumer expenditure rises by only 1 per cent, barely but not significantly more than the National Industrial Conference Board cost-of-living index. This raises a question whether total real consumption rose at all after the 2nd quarter. It may be noted that between the 4th quarter of 1936 and the 2nd quarter of 1937 the Barger series falls 2 per cent while the Department of Commerce series rises 5 per cent. These differences, combined with the known inclusion of changes in inventories of perishable goods in Barger's consumption series, should make one wary of using it as the basis for conclusions about short-period movements of consumer expenditure.

Turning to private investment expenditures, Roose shows the importance of inventory investment and the incompleteness of the recovery of fixed capital expenditures. (He uses only undeflated dollar figures and makes comparisons only with 1929, thereby exaggerating the failure of the recovery.) He believes that in the summer of 1937 the rate of inventory accumulation shown by Barger's figures was excessive in relation to new orders, which declined substantially during the summer, but was not unreasonably large in relation to income, production or consumer expenditures. Roose believes this view is confirmed by Metzler's conclusion that the *level* of inventories was not large in relation to net national product, and refers to this conclusion as "much

[1] Harold Barger, *Outlay and Income in the United States, 1921-1938*, Studies in Income and Wealth, Vol. 4 (New York, 1942), p. 95n. See also p. 95.

the same" as Slichter's conclusion that the *change* in inventories was not dangerously out of proportion to the change in industrial production. He states that a considerable part of inventory accumulation was the unplanned result of the downturn of income, expenditure and production, and concludes that it was an intensifying but not a causal factor in the recession.

Roose gives no reasons that are relevant to the negative part of this conclusion. That the *level* of inventories would not have been burdensome without a decline of national income or expenditures may be true but it proves little about the causal role of inventories. The belief that it does ignores the fact that a mere reduction in the rate of accumulation, which can occur even before the *level* of inventories has reached the level business wants to hold, is a depressing influence. The cautious statement that inventories were "more resultant than causal to the extent that they accumulated because income and expenditures declined" (p. 189) does not answer the question whether they *were* causal to the extent that they accumulated *before* income and expenditures declined. The significant question is when inventory *investment* (not inventories) reached a peak. Barger's quarterly figures, which include only manufacturing and distribution, show a pronounced peak for inventory investment in the third quarter of 1937, but there are reasons for doubting their reliability as an indicator of *total* nonfarm inventory investment. The annual total for manufacturing and distribution inventory investment rises $500 million between 1936 and 1937. Although Abramovitz' figures appear consistent with this, Barger's own annual series for *all* nonfarm inventory investment falls $189 million and the Department of Commerce series falls $350 million. Barger himself says "the very large increase in inventories in the third quarter of 1937 is difficult to credit."[2] The conclusion Roose draws from other data, which gives him greater faith in Barger's series than Barger has, relates to the level of inventories, not inventory investment, and is therefore irrelevant. The whole discussion of inventories, in fact, is marred by confusion between the level and the change of inventories. Sometimes only the language is careless, the meaning being clear (*e.g.*, p. 184, note 1), but too often the confusion is substantive.

Roose's standards for testing whether the rate of inventory accumulation was excessive are the ratios of this rate to the rate of change of output and to the level of new orders, compared with the corresponding past "normal" ratios. Such a ratio will always be deceptive when accumulation of inventories is still a significant component of output. As dynamic business cycle theory suggests, if inventory accumulation is to be regarded as excessive only when it exceeds a certain proportion of the growth of output, the growth of output used to test it must be a sustainable one; it cannot be merely whatever rate of change in output happens to prevail. Observation, too, suggests that the stability of an economic expansion as rapid

[2] *Ibid.*, p 312; cited by Roose, p. 184. Abramovitz, writing later, says about the general question of the time relationship between the downturn of inventory investment and that of demand for other goods: "Were adequate monthly data available, this issue could be settled; but . . . in their absence the facts remain in doubt." (*Inventories and Business Cycles*, [New York, 1950], pp. 497-98.)

as that which occurred in the second half of 1936 and early 1937 is always suspect, for it nearly always includes a large element of inventory accumulation, and a rate of inventory accumulation much in excess of the requirements for long-run growth is always likely to involve instability unless it is set off by expectation of an interruption of external supplies (*e.g.*, war, blockade) or an expansion of final demand *which proves to be correct.* The monetary authorities may have had a sounder instinct than the author if, notwithstanding their publicly expressed views that no injurious credit expansion had yet occurred and that their actions were merely preventive, they actually felt that the very rapid expansion involved dangers despite the presence of unused resources.

In considering the reasons for the fall of fixed capital expenditure, Roose is impressed by data showing that profits may have begun to decline after the last quarter of 1936 and certainly declined after the 2nd quarter of 1937. Average hourly earnings in manufacturing and the average of all wholesale prices rose by roughly equal percentages from December 1936 to March 1937, but between March and June of 1937 hourly earnings rose by 5.7 per cent and wholesale prices declined slightly. Roose concludes from the profits data that the profitability of investment declined while the demand for goods was still growing and that the rapid rise of costs contributed to the recession through disturbing the prospects for profits. The conclusion is first stated cautiously: "insofar as developments in these specific areas [the railroad, building, and electric power industries] may be generalized, and to the extent that investment expenditures were reduced by the prospect of declining profits, the rise in costs reinforced the recessive tendencies" (p. 141). Although no statement is made as to how far these developments may in fact be generalized (beyond excluding the textile and rubber tire and tube industries) or to what extent investment expenditures were reduced by the prospect of declining profits, the author later forgets his caution and indicates belief that a decline of profit prospects (independent of the recession itself) did reduce investment expenditures. Apart from the reversal of profits, he also believes that the level of profits during the whole recovery period was "beyond question" inadequate to stimulate any sizeable expansion in long-term investment commitments. Roose agrees with those who attributed this longer-run situation to business uncertainty over future developments, the increase in the level of individual income taxes after 1934, especially taxation of capital gains, threats of government competition with the public utilities industry, and other political, social and economic factors which raised doubts about the future in the minds of business men, rather than to an absence of investment opportunities.

How sure can we be that profits began to fall while the demand for goods was still rising and that they were dangerously low throughout the recovery period? And how well does this explain the failure of private capital expenditure to recover fully? The only available quarterly data for profits are Barger's, who interpolated from a sample of 700 to 800 corporations which excluded both wholesale and retail distribution as well as finance. Barger's figures decline less than one-third of one per cent from the last quarter of 1936 to

the 1st quarter of 1937 and a further 4 per cent to the 2nd quarter. Although Roose expresses doubt in some places as to the statistical significance of the first decline, and in his summary chapter says, "It does not appear likely, therefore, that the turning point [of profits] was actually reached until the second quarter of 1937" (p. 240), he several times (*e.g.*, pp. 25-26, 204, 225) refers to the cyclical peak of profits in the last quarter of 1936 as though it were an established fact. As the author clearly recognizes in his more wary moments, a decline of less than one-third of one per cent in such a series should be entirely ignored. Although one may conclude that the last quarter was the peak for railroads and communications, for which Barger had good coverage, the manufacturing component of his series reached its peak in the 1st quarter of 1937, mining and public utilities reached theirs in the 2nd quarter, and "other non-manufacturing" reached its peak in the 3rd quarter. Barger's series can be compared with the more comprehensive annual series of the Department of Commerce. Between 1936 and 1937 his series rises from $3.5 to $3.6 billion, while the current Commerce series (also after adjustment for inventory revaluation and income taxes) rises from $3.5 to $4.7 billion. This comparison suggests that Barger's figures understate profits in 1937 in relation to 1936 and that the peak of profits may have been in the 1st or 2nd quarter of 1937. Since the National Bureau of Economic Research places the peak of the cycle in May 1937, we can hardly be sure that total profits began to fall while the demand for goods was still rising. It is still more questionable that they began to fall sufficiently before the peak in the demand for goods to have had effects on capital expenditures large enough to cause the downturn in that demand.

The conclusion that the level of profits was dangerously low during the whole recovery period is supported only by showing that undeflated dollar profits "at their peak in 1936" were 22 per cent below their 1926-29 average and by citing Crum's comparison of "profit rates" (ratios to what is not stated) in 1936 with those of the 'twenties. (The author uses and attributes significance to undeflated dollar figures not only here but in several other places in the book, although prices in 1936 were much lower than in 1929.) Even an adjustment of profits proportionate to prices would understate 1936 "real profits" since it would not fully take into account the lag of the depreciation deduction behind the price level. Moreover, Crum's figures stop in 1936, which was not the peak of the annual figures. Further, reference to Crum's article shows that the figures Roose cites relate to rates of total return (including investment income) after taxes on total equity after taxes; they do not show profits from operations. As Crum himself points out, "the rate of return on direct equity is definitely a better measure of the earning power of the corporate enterprise considered as a productive operation."[3] Crum's figures for all nonfinancial corporations show that, while the total rate of return on total equity fell from 6.84 per cent in 1929 to 5.24 in 1936, the rate of return on direct equity fell by much less, from 5.94 to 5.13 per cent. For manufacturing alone, the only industry division for which Crum shows both

[3] W. L. Crum, "Cyclical Changes in Corporate Profits," *Rev. Econ. Stat.*, (May, 1939), XXI, 61.

rates, the rate on total equity fell from 8.64 per cent in 1929 to 7.94 in 1936 but the rate on direct equity rose from 8.26 to 8.39 per cent, despite the fact that 1929 was a very high year, and 1936 was not the peak year of the recovery. Thus doubt is cast on Roose's conclusion by figures in the very article he cites as evidence.

The evidence is that the post-1933 recovery was not a "profitless prosperity" generally, although it was for a few sectors of the economy. The Department of Commerce figures for profits, which unfortunately begin with 1929, show that in 1936 and 1937 the big deficiencies in profits were in "finance, insurance and real estate" and in railroads. In the aggregate of other fields, profits appear to have been substantial if one allows for the height of the 1929 base and the lower level of prices. Here are the undeflated figures after taxes, both including and excluding inventory revaluation:

	Million Dollars			Per Cent of National Income		
	1929	1936	1937	1929	1936	1937
Including inventory revaluation:						
All corporations	8,420	4,273	4,685	9 7	6.5	6.4
Finance, insurance, real estate and railroads	1,634	−240	−39	1.9	def.	negl.
All other	6,786	4,513	4,724	7 8	6 0	6.4
Corrected to exclude inventory revaluation:						
All corporations	8,892	3,535	4,654	10 2	5.5	6.3
Finance, insurance, real estate and railroads	1,639	−248	−63	1.9	def.	negl.
All other	7,253	3,783	4,717	8 3	5.8	6 4
Implicit GNP price deflator (1939 = 100)	120.9	98.3	102.7			

The failure to use up-to-date profits figures, to use a figure for profit from operations, to allow for the greatly reduced price level, to examine the figures for individual industries and to see how profits of individual industries relate to capital expenditures by these industries, to consider rates of returns in relation to interest rates are serious defects in the statistical part of the argument relating profits to capital outlays.

The author also appears to assume that the *actual* current profitability of the *total* capital stock and the marginal efficiency of investment, which is *subjective* and relates only to the return on *additions* to the capital stock, are the same thing. The two are of course quite different, although they appear to be highly correlated. If one could rely on such a correlation holding at all times, the theoretical confusion itself might not cast doubt on the conclusion about the decline in the profitability of investment, but in 1936 and 1937 it is a question whether one can rely on it. The argument implicit in Currie's Tem-

porary National Economic Committee testimony and explicit in Taitel's TNEC monograph[4] was that current operations might be highly profitable but, with substantial capacity remaining unused, additions to capacity might be unprofitable. This is just one of many factors that might make profits from current operations a poor index of the marginal efficiency of investment. Roose mentions Taitel's argument as an alternative explanation of why construction expenditure was low but never discusses it. He gives no consideration to the related hypothesis of Smithies' valuable paper on "The American Economy in the Thirties," Lawrence Klein, on whose work Smithies drew, or of Gordon, that the stock of capital equipment built up during the 'twenties played an important role in depressing investment in the 'thirties.[5] That some factor besides the level of current profits is required to explain the low level of capital expenditures at that time would have been clear if the author had examined the relation of profits to capital expenditures by industries. He would have found, for example, that for "retail trade and auto services" dollar profits were nearly as high in 1936 and 1937 as in 1929 and deflated profits were higher, but even the dollar volume of new construction by the corresponding category ("stores, restaurants and garages") was less than half of the 1929 level. The same general relation holds for farm net income and new construction. No explanation is offered of the incompleteness of recovery in residential construction, although the government's attitude toward business and the level of business profits could hardly have been a major factor in this field. The failure of recovery in private construction was more pronounced in the area labeled "religious, educational, hospital and institutional and miscellaneous" than it was even in railroads. How is this to be explained? Besides failing to consider the excess-capacity explanation of low business capital outlays, the author does not consider the 60 per cent decline in the rate of population growth from an annual average of 1.7 per cent in 1920-25 to one of less than 0.7 per cent in 1930-35. In fact, I believe that there is no reference to population or its rate of growth in the entire book, apart from a passing reference to the evidence of economic maturity which Hansen gave.[6] Whatever the reason for the failure, the autonomous elements in con-

[4] L. B. Currie, *Hearings Before Temporary National Economic Committee*, 76th Cong., 1st sess., Pt. 9, pp. 3529-33; Martin Taitel, *Profits, Productive Activities, and New Investment*, TNEC Monograph No. 12, pp. xviii, 110-12, 118-22, 132.

[5] *Am. Econ. Rev, Papers and Proceedings*, May 1946, XXXVI, 11-27; also A. H. Hansen and R. V. Clemence, ed., *Readings in Business Cycles and National Income* (New York, 1953). This paper covers the 1937-38 cycle and takes a position very different from Roose's on several essential points, but Roose does not refer to it. L. R. Klein, *Economic Fluctuations in the United States, 1921-41, passim* and especially p. 124; and R. A. Gordon, *Business Fluctuations* (New York, 1952), pp. 397-98, and also "Cyclical Experience in the Interwar Period: The Investment Boom of the '20s," in *Conference on Business Cycles* (New York, 1951), pp. 204-6.

[6] The fact that construction was rising substantially when the downturn occurred, but from a very low level, raises still another possibility: whether the failure of construction to reach 1929 levels might be accounted for by the depth of the trough combined with mere lack of time before interruption by a recession originating in other areas or by higher interest rates.

struction demand were clearly weak and the question is, Why? One is forced to conclude that the author's preference for one or two among several possible explanations, most of which he does not examine, has no clearly discernible basis.

At many points in the book it is not clear how basic a meaning the author attaches to the word "cause." For example, his conclusion about the decline of the government's net contribution is stated in a variety of ways that seem to imply it was not a very important cause of the recession. Thus, it was not a "primary" cause (p. 71); not the "direct" cause (p. 77); only "indirect at most" (p. 71); "overrated as an explanation" (p. 77); not the "principal reason for the later decline in income" (p. 77). But the author also says that the reasons for this conclusion do not answer the question "whether the recession would have occurred had the net contribution remained at a substantial level" (p. 77). This more basic question is treated inconclusively in a few sentences. Elsewhere it is repeatedly assumed that the 2nd and 3rd quarters of 1937 are the "crucial" or "vital" periods. This assumption seems to suggest a failure to appreciate that a downturn could be caused by prior events acting in an economy with given responses, combined with a failure of policy either to introduce new autonomous factors or to alter the economy's responses. There is an artificiality in considering various elements of the situation separately without considering fully their relationship to each other, *e.g.*, the relation of the cost rises to the rise in inventory accumulation; of the latter to the time lag between the decline in net contribution and the downturn of production, and to the increased demand of corporations for external funds; the effect of changes in availability of money on residential construction and many other interrelated factors.

The main conclusions about analysis of cycles that I draw from the book are a further confirmation of what modern cycle and econometric theory tell us, namely, that the main elements making for a downturn may not be found in the period during which it occurs, and that progress in analysis of a specific cycle or in empirical testing of hypotheses requires fuller statements of the hypotheses to be tested, examination of all of them, and considerably more disaggregation of the data.

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International Cycles and Canada's Balance of Payments 1921-33. By V. W. MALACH. (Toronto: University of Toronto Press. 1954. Pp. xii, 154. $3.00.)

This book is the first volume in a new series of Canadian Studies in Economics. The series is off to a good start. Professor Malach has given us a careful scholarly survey of the Canadian major cycle of 1921-33 with particular reference to the theory of the spread of international cycles and the cyclical aspects of balance-of-payments adjustments and capital movements. After an initial brief survey of business cycle theory the book devotes separate chapters to the three cyclical turning points and to the upswing and downswing of

the cycle. Separate attention is given in each chapter to domestic and international aspects. In a concluding chapter the empirical findings for the period as whole are used to test the applicability and consistency of the theories outlined in the first chapter. The book is an excellent example of the objective use of statistical material to test prevailing theories.

The outline of cycle theory seems to follow that set forth in Haberler's standard work with separate attention being given to the monetary, the monetary overinvestment, the nonmonetary undersaving and the underconsumption theories of the cycle. Malach's outline of the international aspects of these theories seems a little forced since many views on the international aspects of cycles are not clearly related to any of the above theories. But this is not too serious, and the literature on international cycles is thoroughly surveyed either in the initial or the final chapter. No explanation is given as to why this particular framework of cycle theory was adopted or why, within this framework, some writers, such as Cassel, were given more attention than others, such as Schumpeter.

A number of Malach's findings are of interest. Thus he shows that cyclical turning points in Canada, a country highly dependent upon international trade, have sometimes preceded and sometimes followed those of more highly industrialized countries. Further, cyclical movements were in some periods less intense and in other periods more intense than those prevailing elsewhere. Thus the economic upswing in Canada was much weaker than that in the United States and in many other countries from 1921 to 1925 but became much stronger in the latter part of the upswing from 1926 to 1929. International trade specialists will be particularly interested in the analysis of capital movements and the mechanism of adjustment given in the final chapter. Both capital movements and the balance on current account were determined primarily by the relative strength of cyclical movements in Canada and elsewhere, it is suggested, and as a result Canada experienced comparatively little balance-of-payment difficulty during this period despite the rather wide swings in her capital movements and her current exports and imports. The irregularity that at times appeared in the flow of long-term capital is explained primarily by the uneven pattern of government borrowing and the bunching of redemptions.

While in the main statistical data are used with due regard to their limitations there are a few instances where the author places more confidence in his data than they really warrant. Thus it is doubtful if the discussion of changes in the propensity to save in the early 1920's, based as it is on unpublished data of doubtful accuracy, can be taken at all seriously. Further, the reader should be warned that the national income data used are based on the old Kuznets' definitions with their curious concept of government profits and losses. And though the author uses his data with care the reader might easily overestimate the representativeness of the seventy series which are used to establish cyclical turning points. In fact, in the index of industrial output from which many of these series are taken, data on the volume of output provide reasonable coverage for less than 25 per cent of the net value added

by manufacturing in 1929. However, these are but minor defects in what is basically a good piece of work. Inclusion of a chart or table on exchange rates would have been helpful to the reader.

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Business Cycles. By EARL C. HALD. (Boston: Houghton Mifflin Co. 1954. Pp. xvi, 518. $5.00.)

In the preface the author states that "this book is intended . . . for the standard course in business cycles . . . in the third or fourth year" of college . . . and that "it does not presuppose . . . an extensive acquaintance with economics." The objective is "to furnish students a minimum background . . . in the study of cycles."

Part I, 110 pages, deals with "the nature of economic fluctuations"—their statistical behavior; incomes and expenditures; and the history of business cycles in the United States. These materials are well organized and controversial issues are held to a minimum. The presentation is supported by numerous diagrams and tables; and so is the historical report which deals mainly with events since 1900. The addition of a discussion of output and prices during the nineteenth century would have added to the understanding of the long-time record of historical tendencies. Except for this omission this introduction to the dynamic character of the economy is well done.

Part II, a survey of cycle theories of about 100 pages, draws ideas from more than forty authors. The presentation would have been improved by rendering a straight-forward statement of each theory without discursive comments. For instance, there is no point in berating the early classical economists for not engaging in the study of business cycles (pp. 114, 216-17). Neither Adam Smith nor Ricardo "ignored or were unaware" of trade fluctuations. They were neither unempirical in their approach nor unstatistical within the limits of existing data and statistical techniques. They spared no effort to diagnose the consequence of bad public finance, of bad banking, of foreign exchange and inflation.

Part III, 158 pages, discusses critically the essence of cycle theories. It covers turning points, money elasticity, savings-investment and income level, consumption and investment, international aspects, and business and economic forecasting. The handling of these materials is verbose to an extent that impairs its effectiveness. The analysis of turning points, which involves the ideas of more than ten theorists, is particularly difficult to follow. The statistical data might well have been preceded by a more extended presentation of principles in order to lend them significance. Perhaps this was not done because these data are not adequate for support of the theories; but neither are they adequate for the purpose of drawing general deductions. Again, on what a theorist holds to be the main issue and what the side issues, greater care was warranted in order to render the account correctly. For instance, I do not believe that Schumpeter would have relied upon "a new swarm of innovators to come along at just the right time . . . when a depression has run its course."

Nor would he have agreed that his theory has "no firm foundation for a theory of recurrent booms" (p. 285). Schumpeter held that development proceeded by discontinuity; that the rallying of the economic system is preceded by resorption and reorganization of its values; and that partial developments may coincide with total development.

The analysis of a country's economy in the adjustment from a capital-importing to capital-exporting position is not clear (pp. 315-16). It is not a problem of differences and/or shifts in respective price levels, no matter how it is considered. The shift of capital has to do with profitability of development, opportunity cost, and comparative cost. It is not true that "Britain sold a large part of her foreign investments" during World War II and that her economic troubles are to be attributed to this and to foreign debt incurred (p. 316). Britain sold 27 per cent of her foreign investments and probably only those for which there were impetuous buyers. As John Jewkes has said, the reduction of income from foreign investments "is insignificant in relation to the real difficulties of the nation" (*Ordeal by Planning*, 1948, p. 215). There is, I think, an error in the computation of the sterling-dollar purchasing-power parity (p. 313). The answer is $9.72, not $2.43.

If I am not mistaken about the caliber of the student who may be expected to dig into the many controversial propositions in Part III, which includes a brief account of the Hicksian model, there will be a lot of gasping. A better job could have been done with a substantial addition or substitution of the Mitchell-Burns approach. That approach does not receive enough attention.

Part IV, on the control of business cycles, 126 pages, discusses policies, monetary and spending, wages and prices. There is here all that one might ask for about disagreements, dilemmas, moral suasion, stimulators, panaceas, and deadlocks. The author favors more built-in stabilizers, and greater activation of industrialization abroad in the event of a decline in the demand for capital at home.

It is my impression that this book will not serve the purpose for which it was designed. The student who does not have "an extensive acquaintance with economics" will find it difficult to handle and the unwary student will get the impression that the analysis of the cycle is a manipulation of concepts.

ERWIN GRAUE

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Money and Banking; Short-Term Credit; Consumer Finance

How Money Is Managed: The Ends and Means of Monetary Policy. By PAUL EINZIG. (Baltimore: Penguin Books, Inc. 1954. Pp. 368. 65c.)

Paul Einzig is a very facile journalist-economist who has a rare faculty of making controversial issues and even technical economic problems understandable, not only to the specialist, but to the average reader of newspapers. This—the latest of his forty-odd books—is an interesting semipopular-semischolarly survey of the monetary system, the changing emphasis which has been given to the role of money in social welfare democracies, and the ever

widening variety of means used in influencing economic, social, and political trends.

Part I of the four parts presents a brief outline of the monetary system, a description of the British system as it now operates, and the author's rather broad conception of what is meant by monetary policy. Part II is concerned with the objectives of monetary policy. With sympathetic acceptance of the Knapp "state theory of money" thesis that "money is the creature of the law," he traces the many ends to which official effort may be directed in order to increase the advantages of the monetary system to society or to reduce its disadvantages. We find chapters on the pursuit of internal and external stability, the policy of raising prices, raising the value of money, accumulating and safeguarding monetary reserves, influencing foreign trade, fiscal objectives, mitigating business cycle fluctuations, full employment, social, political, and other objectives.

Part III deals with the means of implementing policy. All manner of devices are discussed, both new and old. The author devotes aggravatingly short chapters to intriguing subjects: The volume of money or credit is increased or decreased to stimulate business or to step up the pace of the development of the welfare state on the one hand or to check inflationary tendencies on the other. Various categories of borrowers, such as consumers, investors, speculators, buyers of real estate, and export industries, are discriminated against by means of selective credit controls. The level of interest rates is controlled. The budget is deliberately unbalanced in order to expand purchasing power (see page 247 for a neat treatment of Keynes's "theoretical foundation for the new policy"). Taxation is used for discouraging certain types of spending. A variety of treasury fiscal devices are employed, not only to influence the volume of bank credit, but also to increase or reduce banks' cash holdings and liquid assets. Even the velocity of circulation has come within limited control. The author describes in a very interesting manner how in the 'thirties the governments of the United States and elsewhere, deciding that the increase in the mere volume of money had proved futile because people refused to use it, attempted to substitute government spending for private borrowing. Pump-priming operations were initiated on the theory that "if business won't, the government will." In another chapter, the author distinguishes between the quality or buying capacity of money and its purchasing power. Here he makes a case for self-liquidating credit transactions and warns against inflationary unproductive government expenditures and frozen credit. Even price control (rationing by coupons rather than by purse), wage ceilings and minimum wages, rent control, government trading, and other direct methods of government intervention to determine the volume and nature of production and distribution find a place in Einzig's conception of monetary policy. Two chapters are devoted to foreign exchange policy and exchange restrictions and their relationship to domestic welfare.

The conclusions (Part IV) contain an effective appeal for international cooperation which would coordinate domestic monetary policies. The European Payments Union is a step in the right direction and the eventual restoration

of sterling convertibility would be another, but these do not satisfy the author, for, he says: "Even though it may take generations before the ultimate end of the creation of an international currency can be achieved, the progress made in that direction in the past quarter of a century justifies hopes that it will continue" (p. 352). Part IV also contains some interesting observations drawn from recent experience on the role of economists and the reconciliation of theory and practice in determining policy. The book closes with a chapter on the future of monetary policy.

Einzig's credo may be briefly stated as follows: Money has always been managed in the sense that the government is responsible for money functioning at all, but in recent years money management has transcended the traditional role of maintaining a stable standard of value and a medium of exchange through which the price mechanism operates and has become an engine of social reform. The author claims to take a compromise position between the views of extremists, but in effect he leans heavily toward the welfare monetary school, although he does this not with the buoyancy of a reformer but with a tired air of resignation as if he had reluctantly capitulated to the inevitable. For example, he says: "Given the facts of universal suffrage and the menace of Communism, it has become politically impossible to revert to a monetary policy that would disregard considerations of social welfare, even if we wished to do so" (p. 10). With illustrations drawn from the experience of many nations, he attempts to show the disadvantages of inaction with respect to money policy and the benefits derived by utilizing all of the old and many new means of managing money "to achieve the highest degree of welfare for the largest number, if necessary even at the cost of sacrificing stability. Indeed, if the economic requirements of higher productivity come into conflict with the social requirements of equalitarianism, the chances are that as often as not the latter will prevail" (p. 347).

There may be extremists who will find Einzig's compromise views inadequate in bending monetary or economic considerations to social aims, but the whole temper of the volume seems to this reviewer to reflect a willingness to sacrifice a stable standard of value and a sound medium of exchange to promote what might prove to be fictitious welfare. No classical or orthodox monetary economist would want to disregard considerations of full utilization of the country's economic resources and labor force and equity in income distribution, but to the traditionalist, capricious manipulation of the length of the monetary yardstick and the use of government fiat in determining money values do not seem the most promising methods of attaining those ends. Although Einzig does make many reservations and qualifications, the reader, on balance, gets the impression that never-ending prosperity and optimum social welfare by government fiat are attainable and that it is not a mirage, if only the "scientific" money managers learn to conduct their business properly and with balanced self-restraint (see, for example, pages 10, 21-22, 25, 33, 38, 53, 86, 89, 91, 136, 154, 203, 348, 350-351). To the reviewer, this view seems extreme.

The fact that this book appears for the first time in the Penguin series and

is sold at a modest price (one-tenth of what one usually pays nowadays for works of this character) should not deceive the reader. This book is a serious work and should be taken as such by students of the subject; it will have a wide public reception, which it deserves. It could even appropriately be selected as a text or as collateral reading. It includes five pages of bibliography, with a suggestive and useful selection of titles, new and old. The student as well as the general reader will find substance and enjoyment in this volume.

JAMES WASHINGTON BELL

Northwestern University

Public Finance

British Public Finances: Their Structure and Development, 1880-1952. By URSULA K. HICKS. (New York: Oxford University Press, Home University Library. 1954. Pp. viii, 225. $1.00.)

This small book supplies that blend of "learning with lucidity" which is a major aim of the editors of the Home University Library. The events of seven decades of British public finance are skillfully selected and woven into an interesting and thought-provoking narrative. One evidence of the magnitude of the task of compression and selection is to be found in Mrs. Hicks' earlier statement in the preface to her *The Finance of British Government, 1920-1936.* There she mentions the need of explanation and apology for the attempt to include sixteen years of British public finance within a single volume. The fact that she is able also to write the kind of a book which treats over four times as many years in about half as many words is evidence of her versatility and her knowledge of the field.

The book has six chapters which take up, in this order: the growth of public authorities, the forms of public expenditure, the adjustment of the tax structure, local government and the fiscal system, budget balance and national balance, and loan and debt management.

Much of the material could be adapted, with different illustrations and emphases, to apply to the United States and other democratic countries. Public authorities have expanded and their activities have become more centralized. The decline in the range and interest of local activities is making it more difficult to interest able people in taking on local responsibilities. Taxes on income and capital have increased both absolutely and relative to other taxes. This increase has been less in Great Britain than in the United States because of the wide scope and high rates of the British purchase tax. Nevertheless, the author believes that, as a consequence of direct taxation, personal saving has "virtually disappeared" (p. 28) in Great Britain. This means that government must fill the gap either directly or through tax concessions to firms.

The discussion of public expenditure is centered on social expenditure and "the re-establishment of economic activities and policy as an accepted function of the state" (p. 30). Expenditure on defense is mentioned briefly and then dismissed as a "technical matter" (p. 30). The activities of the state in respect to economic policy are emphasized throughout the book, with the

expenditure and revenue aspects brought together in Chapter 5: "Budget Balance and National Balance."

It would be out of order to note any sins of omission in view of the prescribed brevity of the Home University Library series. Since so much had to be left out this reader begrudged the allocation of ten pages in the last chapter to Dalton's debt policies which are described as partly a result of a "personal idiosyncracy" (p. 200). In this chapter, to the American reader at any rate, the developing relationships between fiscal policy and monetary and debt policy seem to be overshadowed by material of a more ephemeral nature. The considerable use of alphabetical designations (B.E.A., N.D.C., P.A.C., P.A.Y.E., etc.) puts some strain on the interpretive powers of the non-British reader. In most cases, however, the context supplies the clue and the essential points are clear. Clarity, in fact, is an outstanding characteristic of the volume.

LUCY W. KILLOUGH

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Program Budgeting: Theory and Practice. By FREDERICK C. MOSHER. (Chicago: Public Administration Service. 1954. Pp. xiii, 258. $5.00.)

Whether in private business or government, the budget is a basic instrument of financial control. Because of the magnitude of its expenditures and the complexity of its operations, the author directed this study primarily to the Department of Defense, with special concentration upon the Department of the Army. Unlike the traditional approach, this inquiry is an attempt to merge the two areas of public budgeting and military administration. Emphasis is on the central budget process, but some attention is given to such related subjects as military planning, unit equipment requirements, manpower control, procurement and personnel systems.

The content of the volume attests to the exhaustive study and thorough preparation which preceded its writing. After gleaning everything of value from published and unpublished documentary sources, the author had personal interviews with a large number of military and civilian employees within the Department of Defense and its three subdepartments and with well-informed persons outside the military establishment. Because of the heavy reliance upon personal interviews with experienced practitioners, the book has a freshness and an authoritativeness often lacking in studies of its kind. What might otherwise have been tedious and dry is interesting and stimulating, although by no means light reading.

The first chapter contains an introductory discussion of the purposes and principles of public budgeting. It dwells upon the factors that make up the environment in which national budgets are developed and administered. These include the time factor; organizational and institutional factors; personal factors; and political, social and economic forces. Chapter 2 is an account of the development and setting of military budgeting with special reference to the war period and unification of the armed services. Changes of a procedural and substantive nature are considered along with the effects of the astronomical increases in the defense budget.

The characteristics and interrelationships of plans, programs, and budgets are treated in the third chapter. It is pointed out that the development and implementation of military plans and programs are essentially functions of central military command and staff. The budget process, on the other hand, is oriented towards the Congress. Budgeting is related to programming in various ways, but the processes are basically distinct. A discussion of planning by the Joint Chiefs of Staff is followed by a critical analysis of the Army and Air Force programming systems. It is observed that the planning and programming systems of these services are still, in large part, hopes and plans.

Chapter 4 examines the extent to which the planning and programming systems have been integrated into the pattern of budgetary administration. Performance budgeting is treated at considerable length and special emphasis is given to the difficulties in applying this technique to military expenditures. One of the major problems is the increasing importance of long-lead items in military activities. Probably less than half of the funds appropriated to the Army for fiscal year 1953 were for the support of operations in that year, and the proportion for the Air Force was even smaller. Much of the budget is thus beyond recall. Suggestions are made for alleviating the problem, but no simple or easy solution is available.

The salient features of internal budgeting operation are sketched in the fifth chapter and the principal problem areas are singled out for particular attention. The author comes thoroughly to grips with the details and problems of internal budgeting. No attempt is made to treat procedures relative to the budget and appropriations in the Congress. A final chapter deals with the functions and responsibilities of military comptrollers and their relationship to the budget.

This meaty book is a valuable contribution to the literature of public budgeting. It is not intended to be a textbook, but it can be read with profit by all serious students of the subject and with particular value by persons both inside and outside government concerned with planning, programming, and budgeting.

H. K. ALLEN

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International Economics

An International Economic System. By JACQUES J. POLAK. (Chicago: University of Chicago Press. 1954. Pp. xi, 179. $4.75.)

This small volume is divided into two sections. In the first part the author builds a theoretical model of the international mechanism of the world economy; and this is followed, in the second half of the book, by a series of statistical studies of the interwar economies of twenty-five countries in their international setting.

In brief outline the model can be summarized in three relationships: (1) fluctuations in a country's exports bring about fluctuations in its domestic activity; (2) fluctuations in national income influence the level of imports;

and (3) the volume of exports of each country is assumed to be determined by the level of world exports which, by definition, is equal to world imports. Taken together these relationships define, when aggregated, a closed system for the world economy. Two approaches are now possible. The analysis can either concentrate on the prime movers of the system, or else on the mechanism itself, *i.e.*, on the systematic part of the system. Polak has followed the latter procedure since he deals with autonomous factors as shocks and is primarily interested in how the system transmits these shocks and at what level it settles down if at all.

As far as the shocks are concerned he is almost exclusively interested in two types: autonomous fluctuations in investment and changes in relative prices, both on the export and on the import side. The importance of the former type is obvious; suffice it to say that with respect to fluctuations in world trade the key role is played by a few major industrial nations. Polak's treatment of the price factors is somewhat surprising and not completely convincing. In the first place he treats price changes as something given from the outside and not as a function of other variables in the system, say, of the levels of effective demand or output. Secondly, he argues that while changes in relative prices may lead to a reallocation of world trade, they are of much less significance for total world trade. But is that necessarily so? Take the case of the postwar imbalance in trade between the United States and the rest of the world. Was not one of the major arguments for depreciations and against discriminatory measures that the former would balance world trade at a higher level than the latter? Thirdly, even in the case of individual countries Polak plays down the importance of relative prices. If he argues that statistical evidence is on his side, there is reason to point out that no account is taken in the book of Orcutt's penetrating criticism of statistical methods similar to those used in the present volume.

When we turn to the three basic relationships listed above, the first one relating income to exports is the conventional multiplier analysis. It may be mentioned, however, that both on theoretical and on empirical grounds Polak decides against introducing time lags in his models. The ultimate value of the multiplier is independent of the existence or the magnitude of lags, and he also finds in the statistics little evidence of such lags between exports and income. Polak then introduces a concept which he calls the international reflection ratio, which represents a combination of the export multiplier and the marginal propensity to import. It indicates "the intensity with which the country under consideration reflects back into the world impulses it receives from the rest of the world." While the notion underlying the reflection ratio is not a new one but can be found, at least implicitly, in a great many other models, Polak's explicit treatment has a good deal of merit. The numerical value of the ratio measures the role played by individual countries in the propagation mechanism and its contribution to the stability (or instability) of the international system. In the statistical section of the study it is shown that the great majority of the countries analyzed are stable in the sense that the reflection ratio is below unity or, in other words, that the world system

is stable. This finding is described as one of the main results of the study.

In the last of the basic relationships, which explains exports of the individual country, Polak departs from a common procedure. Instead of explaining each country's exports as a function of world income, he correlates them with world exports. Quite apart from the question of the goodness of the fits, he argues that the use of world income is unsatisfactory for two reasons. It fails to make allowance for national differences in marginal propensities to import and, secondly, when the level of import controls changes, world exports is a better explanatory variable than world income. As Polak admits, his own approach is not completely general either, since he uses one total propensity to import for each country without allowing for different degrees of economic or political affinity.

In the statistical section the technique used is to fit linear equations by the least-squares method. The author refers to the critique of this method developed by the Cowles Commission, but believes, nonetheless, that it can be used in his models since he deals with simultaneous equations of the sequence-analysis type (no feed-back). But apart from this methodological question there is an additional reason why an appraisal of the statistical section is difficult to undertake. While all sources are indicated, no statistical raw material is presented in the volume itself. Moreover, the author mentions that a considerable amount of "doctoring" of figures and theory was made in order to yield a higher degree of conformity. However, since the exact nature of these adjustments is not described, the confidence of the reader in the findings must in the final analysis be based upon confidence in the "doctor." Finally there is, of course, the question of the applicability of the findings from the interwar years to the present period, a problem which is not discussed in the book.

Let me in conclusion mention that the present volume, while compact, is fairly easy to read. In contrast with some other many-country models, Polak only uses elementary mathematics (no matrix algebra). Together with the recent volume by Neisser and Modigliani, which covers approximately the same ground, it represents a valuable addition to the growing list of empirical studies of the world economic system.

Svend Laursen

Brandeis University

Aid, Trade and the Tariff. By Howard S. Piquet. (New York: Thomas Y. Crowell Co. 1953. Pp. vi, 358. $3.75.)

This book presents the results of an attempt to estimate the increase in U. S. imports which would be induced, under specified conditions, by the complete elimination of U. S. import duties and import quotas (together with the corresponding domestic support programs such as those for sugar, wool, butter). This audacious undertaking, written largely in 1951-52 and published in 1953, and being thus exposed to a considerable volume of critical hindsight, cannot well be denied a correspondingly large measure of charity from any reviewer who may himself not be unbruised by the experience of see-

ing quantitative trade estimates go awfully wrong. Any attempt to quantify what would otherwise be but vague estimates is clearly to be welcomed.

Nevertheless, the methods and assumptions of Professor Piquet's most industrious statistical investigations render it rather difficult to discover the real merit of this book. Apparently despairing of the feasibility of a purely econometric approach to his baffling problem, and at the same time attempting to gauge the detailed impact of tariff and quota abolition on the import-competing domestic industries affected, Professor Piquet took on the enormous tasks of preparing estimates of increases in import values separately for each item in the U. S. tariff list that showed an import value (c.i.f.) of $5 million or more (covering some 80 per cent of 1951 dutiable imports), on the basis of information, apparently largely qualitative, gathered from commodity experts in U. S. government agencies and elsewhere. While many will share his interest in the domestic effects of tariff and quota suspension, I am afraid that the assumptions from which his estimates start are highly damaging to his results. In addition, the published detailed bases for the (largely qualitative) judgment he exercised in arriving at his commodity estimates—as set out in the "Commodity Digests" (Ch. 10, pp. 79-358)—still leave much of the mechanics of estimation obscure.

The key assumptions (Ch. 3, pp. 11-20) are that, for as long as necessary for the effects of tariff and quota suspension to work themselves out, internal demand, domestic and import prices, area of origin distribution of imports, remain as they were in 1951, though not only the 1951 tariff rates and quotas but also the domestic price support and other control programs are assumed to disappear.[1] In addition, no attention is paid to the availability of exportable supplies abroad or to supply effects of these radical assumptions, and estimates for the imports of commodities on which duties were prohibitive in 1951, and for substitution effects as between imports resulting from universal tariff suspension had to be largely abandoned.

Some of these omissions are unavoidable in an exercise such as Piquet's. But 1951—the year in which the immediate post-Korean boom effects took hold on U. S. imports—was as abnormal a year as can be found after the second world war. Therefore, to pile what turn out to be generous estimates of quantity responses to the tariff suspension on the value and price levels of imports in that year cannot but lead to phenomenal results. It is true that the effect on Piquet's value estimates of the altogether abnormal 1951 prices can be disregarded—any monetary scale factor is as good as another—but it really makes little sense to compare the absolute results with the "dollar gap" however defined (*e.g.*, Ch. 4, pp. 21-36) in order to measure the extent to which "trade" might replace "aid."[2]

[1] It would take more restraint than can be expected from a reviewer not to quote the prize understatement of the book (p 20): "Some of these assumptions might not appear to be altogether realistic."

[2] Even Piquet's maximum estimate for the total import increase falls short of the 1951 "dollar gap" as measured by him ($4.6 billion). An elimination of government military aid and military imports from the balance of payments would reduce the statistical "gap" by at least $0.6 billion.

Knowing only partly how exactly they have been arrived at, one can thus only wonder at some of Piquet's detailed results. The total estimated import increase is given as $1.2 to 2.6 billion[3] or 11 to 25 per cent of 1951 total, and 25 to 55 per cent of 1951 dutiable, imports. Total import prices have since fallen by only about 10 per cent, and on this account alone, the overestimate would not seem to be serious. But Piquet's estimates are heavily affected by comparatively few raw materials. Unit values of all crude material imports fell by 30 per cent between 1951 and 1953, and those of the dutiable raw materials which figure prominently in Piquet's estimates fell by considerably more. Almost 45 per cent of the estimated total increase in imports following suspension of duties and quotas are attributed to three commodities, apparel wool, sugar and butter (p. 25). The absolute values of these three increases (doubling wool and sugar imports and increasing butter imports sixfold) are such as to yield total imports of apparel wool, sugar and butter of no less than $815 to 1.090 million, $580 to 775 million and $85 to 250 million, respectively. These figures, little short of millennial for the major supplying countries, lead (exports remaining constant) to trade surpluses of Australia, Cuba and Denmark—all countries typically in trade deficit with the United States—of the remarkable magnitudes of $300 to 450 million, $50 to 220 million and $60 to 65 million per annum, respectively. Wool prices have, since 1951, fallen to less than one-half their level then and the price of sugar shipped to the United States has been maintained at about the same figure only by the domestic support measures which Piquet assumes to disappear (the Cuban "world" price is down by more than 40 per cent). It is true that Piquet assumes a 50 to 100 per cent increase in U. S. imports of these commodities and that what happens to prices on that condition is anybody's guess—but that does not make his estimates more realistic.

At the same time, however, the 1951 distribution of imports by country of origin was quite abnormal: wool imports from sterling-area sources were abnormally high, from Latin America abnormally low, and butter shipments from Denmark were unusually large, coming in, as Piquet himself notes (p. 210), to relieve a temporary "hardship" of that country. On the other hand, his estimates for the increase in imports from major industrial countries are probably too low. At any rate, total actual imports from the United Kingdom, Germany, Italy and Japan in 1953 exceeded the figures estimated by him (Tables 1 and 10, pp. 32 and 77) on condition of tariff and quota suspension.[4] In other words, too much reliance on the 1951 record of imports from raw-material suppliers as a whole and from certain individual countries, and too little attention given to the recuperative forces operative in Western Europe, have warped Piquet's results. The former miscalculation is difficult to extenuate, while in regard to the latter he finds himself in a goodly company of scholars.

[3] The book presents minimum and maximum estimates throughout, the latter being generally twice the former. No clear reason is given for the size of the spread between the two.

[4] The cases of France and Belgium-Luxembourg, whose shipments were abnormally large in 1951 are exceptions, and so is that of Denmark

There is certainly no reason on general grounds to understate the importance for the rest of the world of reductions in the U. S. tariff and quota system, but more harm than good may come from overestimates. Nevertheless, it is a distinct merit of Piquet's exercise to have braved inevitable difficulties and to have attempted to reduce vague estimates to numerical magnitudes; unfortunately, however, his undertaking is needlessly defective. Considering the abnormal distribution of U. S. imports by countries of origin in 1951, estimates which simply apply the 1951 proportions to the future must be suspect, and this fact robs Piquet's computations for the relief to individual countries from the "dollar gap" (Ch. 4 and 9) of much of their value.

It is of some interest to observe, however, that even the estimates of this book for the impact of the import increases on that area of domestic industry which is defined as the "area of maximum competition" (p. 42)—*i.e.*, those industries in which tariff and quota suspension would lead to imports equal to from 10 to 90 per cent of domestic consumption—is quite small. Manufactured imports are estimated to form no more than 1.6 per cent of manufacturing value added, 2.6 to 3.1 per cent of the value of mineral production and 7.5 to 9.7 per cent of cash farm income (p. 46). In several individual industries—and, even more, in several geographical areas—the displacement effects may be serious.

The "Commodity Digests" (Ch. 10) which take up by far the largest part of the book, contain a good deal of useful information (though most of it is available in the Summaries of Tariff Information published by the Tariff Commission), especially on the relation between (1951) imports and domestic production. But the crucial points—namely the precise basis for the estimates of import increases—is, strangely enough, least well covered.

H. K. ZASSENHAUS*

* The author is a member of the International Monetary Fund The opinions expressed above are strictly his own.

Business Administration

Cases and Problems in Marketing Research. By DONALD F. BLANKERTZ, ROBERT FERBER and HUGH G. WALES. (New York: Ronald Press. 1954. Pp. viii, 339. $5.00.)

Case books are becoming an increasingly important part of marketing literature, and *Cases and Problems in Marketing Research* is a welcome addition to the list. It is also the first major contribution of this type to the field of marketing research, an area in which close contact with management problems is particularly helpful. As the authors state in the preface, "It is increasingly recognized that principles and methodology descriptively studied fail to prepare the student sufficiently to deal effectively with marketing research problems in the field."

The book was written to be used in three different ways: (1) In conjunction with a basic textbook in an introductory course in marketing research; (2) As the text in a course in applied marketing research which follows an intro-

ductory course; (3) As the text in an introductory course taught by the case method. This is a difficult assignment, but the authors have accomplished their purpose. As it stands, the book may be used in the first two ways, and with the addition of supplementary material it may meet the third need also.

The material is organized along functional lines and is grouped under nine headings: Formulating the Problem, Preliminary Investigations, Planning, Sampling, Collection of Data, Editing and Tabulation, Analysis and Interpretation of Data, Presentation and Follow-Up, Organization for Research.

These subject areas carry the student through the several steps of marketing research in a logical, orderly procedure. It is the plan of the book to present in each section a short, concise treatment of the high lights of the subject. This gives in summary form the basic principles and procedures needed to handle the cases and serves as an introduction to them. There is also a brief statement covering each of the cases which helps to orient the reader in their use.

The book contains 56 cases, and each of the nine functional divisions has a selection of cases which deal with typical problems in that phase of research. The cases vary in length and complexity and cover a wide scope with respect to types of research situations and fields of business. The result is a very interesting group of problems which will stimulate the thinking of students and give them a sense of the many different applications of marketing research techniques.

In quality, the cases vary from fair to excellent, as is typical of case books, but the general level is high. The presentation of the cases follows, fairly consistently, a logical organizational pattern which includes the background of the case, a statement of the problem, a brief recital of the data available, and the action needed. The latter is stated in the form of a few questions which will help the student analyze the case. Some of the cases also give suggestions for class assignments. The cases are reasonably complete although they are not as elaborate as some of the Harvard case materials in marketing.

One feature of the book, which will enhance its usefulness in the classroom, is the annotated bibliography which is found at the end of each introductory section.

This book merits the careful attention of teachers of marketing research.

EDWIN H. LEWIS

University of Minnesota

Industrial Organization; Public Regulation of Business

Basing Point Pricing and Regional Development. By GEORGE W. STOCKING (Chapel Hill: University of North Carolina Press. 1954. Pp. vii, 274. $6.50.)

This recent volume by Professor Stocking presents an objective, authoritative, and challenging analysis of basing-point pricing and the public welfare.

Stocking finds that "basing point pricing developed in iron and steel as a means of stabilizing the industry," and that the "combination movement in

iron and steel at the turn of the century greatly simplified the Steel Corporation's role as the 'great stabilizer.'" More specifically, he states that basing-point pricing, as a general practice, was "adopted concertedly by business rivals anxious to escape the rigors and uncertainties of unrestricted competition"; leaders in the steel industry turned to basing-point pricing because of their experience and belief that "unrestrained competition," particularly during periods of slack demand, gives rise to results which are "ruinous," "tyrannical," and "destructive." In their view, steel producers are under strong compulsion to "cut prices"—usually in a discriminatory way—when supply exceeds demand because of high fixed costs and a technical need to keep furnaces in operation. Although lower prices for steel will increase the customers of a *particular* seller, it is believed that they will not increase the *total* demand for steel. The drive to make sales, therefore, in their thinking, forces prices in some areas or to some buyers to ruinous levels.

Basing-point pricing, Stocking finds, has served the interests of influential industry members in restraining price competition and in providing greater profits. But what have been the consequences and effects of the practice on the economy of the South? A thorough analysis leads the author to conclude that: "Basing point pricing in steel has contributed to the South's poverty by curbing the expansion and utilization of its steel-making facilities and by retarding the growth of steel-consuming industries." Birmingham was a "low cost producing area," but under Pittsburgh-Plus consumers were denied the advantages of their location. After 1938, with the introduction of multiple basing points equalized with Pittsburgh, moreover, the South continued to be handicapped, because the Birmingham mills could not use their lower costs to make competitive price reductions and expand sales in the southern areas. Other deleterious effects of basing-point pricing include the maintenance of prices at high and rigid levels, the practice of granting discriminatory lower prices to large customers, the inclusion of fictitious freight charges for use in subsidizing sales in distant markets, the cross-hauling of steel products, and the growth of cost-raising methods of doing business.

Stocking's appraisal of basing-point pricing is most impressive, disturbing, and challenging. It deserves to be widely read by businessmen, economists, congressmen, government officials, and lawyers. Its significance applies, moreover, not only to the South, but also to the West, and to the nation as a whole.

Chapter 8, The Law on Basing Point Pricing, provides an up-to-the-minute summary of (1) the courageous and intelligent attack on basing-point pricing by the Federal Trade Commission; (2) the gradual weakening of the Commission's attitude toward systematic discrimination; and (3) the final acceptance by the Commission of the steel industry's demand for discriminatory delivered pricing and freight absorption "when innocently and independently pursued, *regularly or otherwise,* with the result of promoting competition" (Iron and Steel Order, 1951).

Stocking's analysis of basing-point pricing, I believe, will find a wide area of agreement among economists. His proposals on policy (action), however,

are likely to encounter some differences of opinion. Few will disagree that systematic basing-point pricing through collusive action ("what we have had") should be forbidden. But what of the alternative of permitting freight absorption, freight equalization, and freight allowance, "independently" pursued? Stocking appears to look with favor upon this alternative, believing that it is "a sound business practice" which "intensifies business rivalry." Here, I suggest, there is a serious dilemma. If two or more geographically separate mills quote their own f.o.b. mill prices and then regularly discriminate (by absorbing freight) to meet delivered prices in each other's "back yard," are they not getting the same result as the concerted use of a multiple-basing point system (Count II in the *Cement* case)? Is not the practice one of conscious parallel action (Count II in the *Conduit* case)? Is not the buyer again faced with the stone wall of price identity? Similarly, if two or more geographically separate firms regularly absorb freight in freight-allowed or zone pricing, how can the practice withstand the inference of conspiracy (*Crepe Paper*, *Malt*, and *Milk Can* cases)? Moreover, if freight is absorbed not to match but to undercut a distant rival's delivered price, is not the practice one of cutthroat competition, whereby smaller, though efficient firms, can be brought to terms by large, multiplant concerns able to make up temporary losses in other areas where no competitors survive?

"Unrestrained competition" in given situations may undoubtedly result in ruinous competition. Geographic separation of producers, high fixed costs, and other factors give sellers degrees of local monopoly power which they can, and do, use in discriminatory pricing. This can be ruinous. Such conditions, it may be urged, provide the reason for making geographic discrimination prima facie illegal. Basically, it appears, we must choose between (1) the acceptance of regular and systematic freight absorption (basing-point pricing) or (2) the condemnation of its cooperative use by two or more sellers. As Mr. Charles L. Hogan, President, Lone Star Cement Company, testified in the *Cement* hearings, the only workable alternative to f.o.b. mill pricing is "f.o.b. *destination* pricing," *i.e.*, some form of basing-point or zone pricing. The basic problem which must be grasped is the significance of the practice of price discrimination. Is price discrimination a competitive or a monopolistic practice?

VERNON A. MUND

University of Washington

Private Enterprise and Public Policy. By MELVIN ANSHEN and FRANCIS D. WORMUTH. (New York: Macmillan. 1954. Pp. xiv, 742. $6.75.)

In our society government and private enterprise impinge upon one another in many ways, a number of which are pointed out and described in this new textbook. With the sugar industry and railroads as illustrations, the opening chapter usefully indicates the effects of pressure groups on public policy. Constitutional and administrative principles are outlined in the next two chapters. Part II, "Techniques of Governmental Action" (mainly federal) has eight chapters: antitrust and other trade regulation (two chapters); "governmental preconditions to business action" (incorporation, licensing,

etc.); control of rates, prices, and wages; "governmental benefits" (discussed below); regulatory taxation; governmental operations (fiscal and monetary, government ownership, and yardstick competition); and business self-government. Chapters in Part III, "Public Policy in Special Areas," cover: the power industry; transportation; communications; finance (banking, insurance, investment banking, public finance, and international finance); agriculture; labor; the war economy; and economic depression. Part IV, "Administrative Problems," begins with two chapters that present a half-dozen short case studies and ends with one on "planning."

One must judge a textbook with the subject matter and approach of a particular course in mind. There are many varieties of junior or senior classes in "government and business" for which this book is intended. For example, although the subject requires a blending of political science and economics, one or the other may be emphasized. This review is concerned only with the usefulness of the book for courses stressing economics and for which a course in principles of economics would be prerequisite. For such courses the book is disappointing in its organization and in the level of its analysis.

Surely there is something wrong with a principle of organization that groups into one chapter (because all are "governmental benefits") patents, copyrights, crop insurance, the Federal Housing Administration, the Reconstruction Finance Corporation, deposit insurance, the Export-Import Bank, the Maritime Administration, the War Damage Corporation, agricultural price supports, public lands, and postal subsidies. All these—and more, for I have omitted a number of topics—take 32 pages; a two-page "evaluation" follows! No chapter is more heterogeneous, but as the summary above indicates, others are similar. Sometimes, too, essentially related material is arbitrarily separated. Will students reading the chapter on the power industry recall *Smyth v. Ames* and the *Hope* case from the discussion of "Control of Rates, Prices, and Wages" 150 pages earlier?

The level of presentation only occasionally rises above that of the better elementary economics books. The sections on monetary and fiscal policy nearly fall below that mark. In particular, the authors do not take much advantage of their opportunity to use the tools of analysis that students have acquired in their introductory economics course. For example, after a very sketchy set of market-structure definitions, the chapters on antitrust turn to a series of laws and cases emphasizing legal rather than economic tests. The problem of reconciling law and economics never comes through. After an extremely short discussion, antitrust control of oligopoly is dismissed as impossible. Near the end of the book there is a section on "practical problems in antitrust operations," but the ones discussed are size of staff, appropriations, and the like, rather than the fundamental difficulties of defining intelligent economic policy. Because the authors do not work from an explicit analytical framework, the sections that close many of the chapters are mere summaries, not "evaluations" as their headings promise.

The authors' encyclopedic coverage of problems, statutes, and government agencies will give students a feeling for the manifold interrelations of private

and public activity. But perhaps a brief aerial survey would be a more economical way to accomplish that useful task, so that the major space could be allocated to a detailed treatment of a smaller number of subjects. Also, it would be better to give monetary and fiscal policy, labor, and perhaps other subject areas, as courses in their own right, rather than as short stopovers in an omnibus course.

What will students carry away with them from a course in "government and business"? Unless the subject can be narrowed, and the analysis deepened by building it around an analytical framework, they will retain at the most—and only if their memories are exceptional—a list of statutes, cases, and agencies. What they need is a real grasp of the economic (and political) issues in forming public policy in relation to private enterprise. This textbook will not lead to this result; and I am all the more regretful of the necessity of so reporting because the quality of the discussion in certain places, the excellence of the "selected references," the authors' familiarity with day-to-day governmental operations, and their balanced and good-tempered attitude toward public policy all suggest that they might have reached that goal. I am sure that my most critical remarks apply less to them than to the market they have tried to serve.

HOWARD H. HINES

Iowa State College

Public Utilities; Transportation; Communications

The Pacific Coast Maritime Shipping Industry, 1930-1948. Vol. II, *An Analysis of Performance.* By WYTZE GORTER and GEORGE H. HILDEBRAND. (Berkeley and Los Angeles: University of California Press. 1954. Pp. xix, 371. $5.00.)

The second volume of this study of the Pacific Coast shipping industry presents the authors' analysis of the underlying causes of the dismal picture of secularly declining demand, pronounced short-run instability, and stagnant employment opportunities painted in Volume I.

The first two chapters include a concise summary of the commodities carried in the four "trades" which comprise the industry and of the geographic pattern of its foreign commerce. The remainder of the book is devoted to the formulation and quasi-empirical testing of a series of hypotheses as to proximate causes for the industry's poor performance in the period 1930-1948.

Some of these are necessarily routine in nature and are so treated. Thus the conclusions that commercial policies of the 'thirties operated to reduce the demand for maritime services and the reciprocal trade agreements to increase them are neither debatable nor—unfortunately—measurable from the data available to the authors. The same might be said of the influence of general economic fluctuations, war, and work stoppages on short-run instability in the demand for shipping and longshore services. In none of these instances does the empirical material add much to conclusions quite evident in advance.

Subsequent chapters are more interesting and provocative. The thesis that

the extraordinarily rapid growth of the Pacific Coast regional economy not only failed to stimulate the maritime industry, but actually worked to its detriment is persuasively developed, despite the acknowledged necessity of reasoning from circumstantial evidence.

The authors properly stress the fact that these factors, together with the steady worsening of the competitive position of water carriers vis-à-vis foreign shippers and rail and motor transport, created an environment in which no internal industry policies could have achieved more than a more orderly retreat. Nevertheless, interest in this study will almost certainly center on the chapters dealing with the almost unbelievably bitter and frustrating relationships among employers and the maritime unions from 1934 to the present.

As careful and scholarly observers, the authors are at pains to present fully the claims and counterclaims, the overt and the hidden issues, the honest and the dishonest techniques of both sides. Anyone familiar with the industry will be aware of the fact that to do this intelligibly is a task of no mean proportions, and in this instance the presentation is admirably concise. Yet the battles were so vicious, and their consequences so detrimental to all in the industry, that one almost inevitably takes sides; and this is clearly evident in the present volume.

The authors find—properly, I think—that the failure to develop a mutual recognition of interlocking interests reflects the absence of the intent to bargain in good faith. And though they make no attempt to gild the employer group, the failure to reach a satisfactory *modus vivendi* after the 1937 settlement is attributed largely to the intransigence of the International Longshoremen's and Warehousemen's Union; more specifically, to the policies of Harry Bridges; and, still more specifically, to the Communist ideology which they feel accounts for those policies.

It may well be that these conclusions are close enough to the truth to constitute an important part of the explanation of the industry's sorry record of work stoppages and the persistent tendency to price itself out of most of its markets. But in this volume they are emphasized to the point of glossing over the sometimes equally unreasoning truculence of the employers' bargaining units, and the latent hope and desire that unionism could be shackled if not destroyed which cropped out again after passage of the Taft-Hartley Act. Equally questionable is the constant reiteration of the "irresponsibility" of the ILWU leadership, against which the actions of Lundeberg and the Sailors Union of the Pacific show up in the book as "tough" but "mature" and thus more consistent with the end of mutual recognition of interests.

It should be reiterated that the authors have outlined the basic facts concerning the development and techniques of collective bargaining in the industry without bias and in terse, effective style. The conclusions they draw are not forced on the reader, and others may well be drawn from their own presentation.

As in all careful analyses of industry structure and performance, this study derives much of its value from the compilation, evaluation, and organization

of source materials not readily available elsewhere. Except for some repetition dictated by the somewhat arbitrary division into two volumes, the books make unusually easy reading, largely because the authors have a pleasant willingness to use English where technical jargon would do.

JAMES A. CRUTCHFIELD

University of Washington

Economics of Canadian Transportation. By A. W. CURRIE. (Toronto: University of Toronto Press. 1954. Pp. vii, 727. $10.00.)

The present volume is the first general treatise on Canadian transportation to appear since the late Professor Jackman's *Economics of Transportation,* published in 1935. It is similar in scope and organization to the latter and also to some of the standard American texts on transportation. The primary emphasis is on rail transportation but there are individual chapters on highway freight transportation, highway passenger transportation, inland water transportation, ocean transportation and air transportation. The author states in the preface that he has attempted to meet the needs of various classes of readers, particularly "the smaller shippers who from time to time have to appear before one or other of the regulatory authorities" (p. v). He does not mention the possible use of the volume as a text in college and university courses in transportation.

The discussion of rail transportation is concerned primarily with the rate level and rate structure. Three chapters, totaling 115 pages, are devoted to the evolution of the rate level. These chapters will be valuable to specialists, but some may feel that they are too detailed for a general treatise. The chapter dealing with the theory of railway rates is adequate but, in the reviewer's opinion, open to criticism in one respect. After referring to the relation of decreasing cost to railway rate-making he says, "The other principle or economic 'law' underlying the theory of freight rates on individual commodities is that of joint cost" (p. 159). Later in the chapter, however, when he summarizes the controversy between Taussig and Pigou as to whether it is joint cost or monopoly which explains discrimination in railway rates, it may be inferred that he agrees with Pigou, for he says that "On the whole railway history has substantiated Pigou's point of view" (p. 170). If this interpretation is correct it would seem that the author should have given primary emphasis to the role of monopoly in explaining railway rate discrimination, with only incidental reference to joint cost in view of its very limited applicability in this field.

The volume portrays very well the significant similarities and differences between American and Canadian transportation policies. Thus the equalization of railway class rates in the United States, except for Mountain-Pacific territory, has been paralleled by equalization in Canada, except on the White Pass and Yukon Route and in the Maritime Provinces, effective March 1, 1955. On the other hand, in contrast to the situation in the United States, the regulation of highway transportation has been left entirely to the provinces, apparently in part for political and constitutional reasons and in

part because interprovincial and international highway traffic amounts to no more than 3 to 5 per cent of the total. The scope of regulation is similar to that in the United States in the case of bus transportation but is less comprehensive in the case of trucking. Thus all the provinces regulate bus fares and all but Newfoundland require bus operators to secure certificates of convenience and necessity. All except four of the provinces require certificates for common-carrier truck operation, but only three effectively control common-carrier trucking rates. Contract carriers are subject only to safety regulation.

Canadian policy with respect to air transportation is of interest in view of the controversy in this country as to whether airlines should be regulated by the same agency which regulates other forms of transportation or by a separate agency, and whether surface carriers should be permitted to control airlines. Beginning in 1938 the regulation of air transportation in Canada was entrusted to the Board of Transport Commissioners which at that time also had jurisdiction over railways and certain inland water carriers, as well as express, telephone and telegraph companies. In 1944 dissatisfaction with the Board's regulation of air transportation led to the transfer of its regulatory authority in this field to a newly created Air Transport Board. At the same time surface carriers were ordered to divest themselves of control over airlines, but the order was not made effective immediately and in 1946 was modified so as not to apply to the Canadian Pacific and Canadian National railways.

Finally, it may be noted that the chapter on ocean shipping reveals that there is much similarity in the problems of the Canadian and American merchant marines and in the policies pursued with respect thereto.

In the reviewer's opinion the author might well have included a chapter on railway accounting and accounting regulation and one on the effect of freight rates on the location of industry. There are no maps, charts or statistical tables and the usefulness of the volume would have been materially enhanced, especially for American readers, if at least a few such aids had been included. There are extensive footnotes but their usefulness is greatly reduced by being placed together at the end of the volume. Finally, it is unfortunate that the publisher should have thought it necessary to put a $10 price on the book. However, these criticisms do not alter the fact that both American and Canadian students of transportation are heavily indebted to Currie for preparing this thorough, well-written and much needed study.

ROBERT W. HARBESON

University of Illinois

Land Economics; Agricultural Economics; Economic Geography

Methods of Crop Forecasting. FRED H. SANDERSON. (Cambridge: Harvard University Press. 1954. Pp. xiv, 259. $5.00.)

This book reviews methods currently in use for forecasting crop production and explores a number of techniques for refining existing procedures. In the

words of the author one of the objectives of the book was to "present in summary form the contents of a large and widely scattered literature." Certainly Mr. Sanderson has done this part of his work well. The book summarizes studies touching on important phases of crop forecasting both from the United States and other countries. The study is especially timely in that it comes during a period of increased activity on the part of the U. S. Crop Reporting Service to improve the accuracy of its estimates.

Part I examines the statistical tools that are useful in crop estimation. The author presents no statistical techniques not reported elsewhere but he does perform the highly useful function of bringing together in one place the major statistical developments of value in crop forecasting.

Part II moves to a study of methods of estimating and forecasting acreage. Part III deals with problems of forecasting the yield of crops in advance of the harvest. In this section, Sanderson devotes considerable attention to errors arising out of inaccurate observation or bias on the part of the crop reporter as distinguished from sampling error and bias associated with the selectivity of the sample.

Part IV explores possibilities for refining estimates by basing crop forecasts on the observation of ecological and weather variables. While such a system would sidestep many of the problems involved in predicting yields through observation of the condition of growing crops, Sanderson emphasizes that efforts in this direction are handicapped by a lack of adequate meteorological data and well-defined hypotheses concerning the causation of yields.

The author points out several areas in which the forecasting procedures employed by the Crop Reporting Service have failed to keep pace with the development of improved techniques. However, he is somewhat more tolerant of the shortcomings of the estimating procedures now in use than many other critics and displays an acute awareness of the limitations imposed by budgetary restrictions and the need for economizing in crop forecasting activities. He explores several sampling devices which, while involving a loss in "statistical efficiency," increase the economic efficiency of the estimating procedure.

The book is well written and should be comprehensible to anyone with an understanding of the concepts presented in the basic courses on statistical methods. It should prove highly useful to those interested in bringing themselves up-to-date on the present status of crop estimating procedures with a minimum of effort.

RAYMOND R. BENEKE

Iowa State College

Real Estate Finance. By HENRY E. HOAGLAND. (Homewood, Illinois: Richard D. Irwin, Inc. 1954. Pp. ix, 515. $6.00.)

This book contains information on almost all aspects of real estate financing; however, it is basically concerned with presenting home financing procedures rather than a thoroughly definitive discussion of the principles and problems of real estate financing. The twenty-seven chapters contain three principal categories of information: (1) descriptions of real estate financing

instruments, (2) a review of the characteristics of the principal sources of real estate mortgage funds and the procedures used in disbursing these funds, and (3) a general statement of government home financing programs.

The volume is written in a narrative descriptive style and provides general indoctrination in the home financing procedures in which the author believes. Professor Hoagland's many years of teaching, business and governmental experience in real estate provide the background from which he develops in broad outlines general real estate financing principles and procedures.

The book has been written for students as well as practitioners and should be useful to the student who has completed one semester of real estate principles; to the practitioner with only limited experience in home mortgage lending; as a supplementary text in an introductory course in real estate stressing real estate financing; and as a general review of basic home financing principles and procedures for the advanced student and the experienced practitioner.

The author's approach to real estate financing is broader than those of other authors on real estate financing who typically stress the lenders' views on mortgage financing. He discusses real estate financing from the viewpoint of (1) the lender, as in Chapter 20 "Mortgage Loan Servicing," (2) the borrower, as in Chapter 1 "Introduction," and (3) the practitioner, as in Chapter 18 "Appraisal for Financing Purposes." Although home financing is stressed, he also includes chapters on financing farms, subdivision and development financing, and federal housing programs.

The book would have been strengthened by inclusion of more complete discussions of such aspects of home financing as new-custom-built home construction financing, the steps in the home financing process, mortgage loan appraisal for single-family homes, regional differences in mortgage financing, and the impact of neighborhoods and districts on lending terms. The analyses of institutional lenders, government impact, and federal housing programs would have been more meaningful if they had been preceded by brief summaries of money markets and the flow of funds into mortgage markets. Advanced students of real estate and experienced practitioners will want to supplement the discussions of institutional lenders, lending instruments, and governmental housing programs with a review of the National Bureau studies in real estate finance, Housing and Home Finance Agency real estate research reports, and other recent real estate research publications referred to only infrequently in the book.

The author does not attempt to speculate on such vital topics as the reasons for the growth of savings and loan associations in the postwar period, the implications of increasing federal support for single-family home financing, the basis for the trends to long-term, high loan-to-value, low-interest-rate home mortgage loans. Definitive evaluations of these and similar matters by a scholar of Hoagland's stature would have increased the usefulness of the book for the mature student and the experienced lenders.

The book is welcome because it brings together the newest as well as the most generally accepted principles and procedures in real estate financing.

Hoagland has performed a service in synthesizing the many varied aspects of real estate financing into simply stated principles and procedures. Other scholars should be challenged to study these principles and procedures and test them in the light of the continuing stream of research materials now being published on real estate finance.

FRED E. CASE

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Labor

Manpower in the United States: Problems and Policies. By WILLIAM HABER, FREDERICK H. HARBISON, LAWRENCE R. KLEIN, and GLADYS L. PALMER, editors. (New York: Harper & Bros. 1954. Pp. xi, 225. $3.00.)

In the opening essay of this collection, called "Work in the Life of an American," Daniel Bell emphasizes the profound influence of scientific management, with its "division of labor" and "fragmentation of work" upon the life of the American laborer. He might have gone a step further. The book itself is an example of the "task system" in scholarly output. It is another sample of that increasingly common academic performance, the collective treatise: 225 pages long, four editors, sixteen essays, and twenty authors.

Manpower in the United States is introduced by the editors as a study in the "specialized branch of economics . . . in which the concept 'manpower' specifically denotes labor market dynamics and labor force characteristics and attributes" (p. ix). If this definition leaves the reader with something less than a crystal clear understanding of the job territory of the manpower economist, he may read on to discover that "from studies of these matters policy is both evaluated and created. . ." and that, in the editors' collective opinion, "the objectives of public policy today" should be: (1) to maintain a high-level employment economy. . . . (2) to build and maintain a stable work force. . . . (3) to utilize the labor force efficiently through proper matching of jobs with people, effective management, and the appropriate education, training, and development of people, and thus to raise the productivity of labor and the general standard of living throughout the nation. (4) to provide reasonable security against . . . illness, unemployment, disability, and old age. (5) to preserve and enhance the freedom, dignity, and worth of the individual. . . . (6) to provide the proper . . . distribution of manpower between our armed forces and civilian work forces. . . ." (pp. ix-x).

Not quite all of the above matters are covered in the present volume. The book has three main parts: I. "Utilization and Motivation of Workers" (five essays), II. "Changing Dimensions of the Work Force" (seven essays), and III. "Manpower Mobilization" (four essays). It has also the unevenness of quality, the diversity of treatment, and the tendency toward repetition of many such collections. *E.g.*, it ranges in quality from a few brilliant and informative chapters by Bell (see above), Wolfbein ("The Geographic Distribution of Nonfarm Employment"), Bancroft ("Trends in the Labor Force"), and Ginzberg and Anderson ("The Shape of Military Manpower

Policy"), on down to several thoroughly pedestrian summaries of standard labor problems and Solomon Barkin's hard ride on his hobby of "Job Redesign: A Technique for an Era of Full Employment." (Barkin's thesis: criticism of hiring officers, who "look for the most productive person among, rather than the best job for, the applicants. . . . The convention is that people must be suited to the jobs rather than jobs to the people" [p. 40].)

The author list is imposing and the title list intriguing. The essays mentioned above are excellent and one or two others are almost as good. However, for this reviewer at least, the book as a whole simply did not come off. There was no sense of unity, no feeling of approach to "a problem," simply a collection of pieces, ranging from good to ordinary, on a variety of topics. Perhaps the fault is the reviewer's; perhaps the fault lies in the approach, the target being too big; or perhaps, just perhaps, this is carrying division of labor too far and we should recombine some of the jobs in manpower economics to bring back a sense of work significance to the laborers in that classification.

O. W. PHELPS

Claremont Men's College

The Impact of Strikes: Their Social and Economic Costs. By NEIL W. CHAMBERLAIN and JANE METZGER SCHILLING. (New York: Harper and Brothers. 1954. Pp. viii, 257. $4.00.)

Estimating the cost of strikes, as of other kinds of warfare, is a tantalizing problem. While it is easy enough for the partisan to command sympathy for the losses of those he favors, to make a dispassionate appraisal of net effects is a different matter. Many of the relevant statistics are unavailable; people are affected in varying degrees; and the proverbial truths that one man's meat is another man's poison and that it's an ill wind that blows nobody any good are only too applicable. "Because of these conflicting factors," wrote Florence Peterson of the U. S. Bureau of Labor Statistics in 1937, "an estimate of the cost of individual strikes or the cost of all strikes in a given period is misleading as well as inaccurate"; and more recently the Bureau has described the making of such estimates as an "impossible job." This has not deterred the authors of the present study—and will probably not deter others—from attempting it.

Professor Chamberlain has made a heroic effort to simplify his problems. After describing his method, which in conception is both ambitious and novel, he applies it to seventeen large strikes (11 coal, 3 rail, and 3 steel), mostly postwar. He enumerates the various "publics" presumed to be affected by the strikes; and he tries to measure, for each of these "publics," first, the importance to them of the particular good or service in question (its "cultural necessity" to consumers, "production necessity" to dependent producers, etc.); second, the extent to which on a particular day—usually at the peak of the strike—supplies could be maintained from stocks ("stock effect"); and third, the extent to which substitutes could be found ("substitutability"). Each of these effects is rated on a 10-point scale, and the readings are combined in

such a way as to give an "urgency rating" for the particular "public" considered. The various urgency ratings are then multiplied by the estimated sizes of the respective "publics," and a total strike rating is arrived at which can be compared with those for other strikes.

Unfortunately the very neatness of the method underlines the tenuity of the data on which the results are based. Certain of the figures used come from official reports; some are from newspapers; but many of the estimates—notably those relating to "cultural necessity," "market necessity," "substitutability" and the recoverability of strike losses—are the purest guesswork: "an allowance of 60 per cent is made for recoverability, . . . but an additional allowance of 90 per cent of strike losses is considered to have been offset by the close concern of strikers' families with the outcome of the dispute." The procedure is inevitably, if sometimes alarmingly, flexible: "if this procedure too grossly understates the effect, then additional categories may be added." The detailed discussion of the effects of particular strikes on particular "publics" is interesting as speculation, and the argument sometimes appears cogent enough (for example, the commonsense conclusion that household consumers are not necessarily the most important sufferers was certainly worth stressing); it is the insistence on dubious statistics that is disturbing. "The advantage of the rating device is that it forces the assessment, in relatively precise terms, of all the numerous variables which together determine the impact of a strike on the public." But "relatively precise" is a scarcely permissible euphemism, and "all" is certainly an exaggeration.

A wider purpose of the book is, according to the jacket, to "provide an important new basis for realistic legislation." Legislation is founded on rights; and the social philosophy of the authors is based on "rights of expectation" (expectation of buying what we need and selling our goods and services in order to be able to do so): "to the extent that a strike inconveniences us, then, it frustrates our rights of expectation, rights which are just as surely built into our culture as if they were matters of law." But what of the strikers' "rights of expectation"? Those who are "inconvenienced" by, say, the withholding of a wage increase which they consider overdue might fairly ask Chamberlain by what hedonistic calculus he would balance their rights against "ours." The striker is, indeed, the most stubborn factor in the situation, and the authors virtually ignore him in their very natural concern for his victims, the "public." "There is rather clear evidence that large sections of the public would welcome almost any substitute for the strike." What substitute? If an inconvenient strike can be averted only by granting an exorbitant demand, or outlawed only at the cost of producing chronic industrial apathy or unrest, the price may be greater than the benefit bought. In any serious strike situation, the action taken may profoundly affect the future course of relations within the industry; and in such a context the public's immediate reactions may be largely irrelevant. Thus even supposing that the sort of effects discussed in this book could be predicted accurately (which they certainly cannot), short-term economic expediency is not necessarily a very good guide to action. This is after all the core of the strike problem—a problem which,

after credit has been given to the present authors for their enterprise, remains beyond the reach of so narrow an economic analysis.

K. G. J. C. KNOWLES

Institute of Statistics, University of Oxford

Collective Bargaining in the Railroad Industry. By JACOB J. KAUFMAN. (New York: King's Crown Press. 1954. Pp. xi, 235. $3.75.)

This is a modest, useful book which will, no doubt, be a handy reference for its period. It does what it sets out to do, namely to give the background of the Railway Labor Act and to study its operations in detail from the amendments of 1934 to 1952. The author has been employed somewhere in the field of railway personnel administration and it seems to have been a labor of love for him to gather up the available references and to present a complete if condensed story.

Those who are not technicians operating in this field will, however, wish that Mr. Kaufman had raised his sights a little bit. Here is a record of the declining power of capital and the rising power of labor displayed with a clarity found nowhere else in America. By 1916 the Railway unions were able to make the Congress jump through hoops at command. It was a foretaste of the great and permanent change of 1933.

The economic literature is full of the efforts of monopolistic competitors to find their way through the maze of legislation and regulation set up to frustrate their efforts. The running trades have no such problem. They are a monopoly and make no bones of it. They freeze working conditions and prevent agreement with individual roads for the more intelligent application of labor in order to preserve what they think are their advantages.

From about 1920 the railways' share of the national income was declining. The numbers of their employees shrank both absolutely and relatively. Their differential advantage over workers in the manufacturing industries also shrank as the latter also organized.

The very high degree of organization of railway workers does not change the nature of the ultimate adjustment (except, possibly, by making the final position worse than it might otherwise have been), but it certainly does change the path by which it is reached.

It is a misfortune that Kaufman was not greatly interested in the forest; but he has given a good description of the trees he chose for his own.

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Modern Labor Economics; An Analysis of Labor-Management Relations. By PEARCE DAVIS and GERALD J. MATCHETT. (New York: Ronald Press. 1954. Pp. xviii, 659. $6.00.)

This is a worm's eye view: the student enrolled in the introductory course in labor economics looking at a proposed text. What standards, we may inquire, would this fellow expect the book to meet and how does this particular volume measure up?

He would insist, first, on comprehensiveness, on dealing with all the topics needed for a basic understanding of labor problems. The authors acquit themselves very well on this score.

Second, he would expect the volume to be systematic, to hang upon a logical framework. Here, again, Davis and Matchett score. Their structure makes sense and it is not hard to find the discussion of a particular topic.

Third, he would like to come away from the book with a set of insights that help him explain the world of labor. In several instances, for example, the description of the trade union, the discussion deals only with formal, surface phenomena. Although the information is quite accurate and the writing is not without a certain sophistication, there is little penetration.

Fourth, he would want his text to do too little rather than too much, to hit the key ideas and omit the factual tonnage, which can be found in supplemental readings. Here, too, the treatment is not satisfactory. The freight carried by the book is too heavy and the reader staggers under the load. Much of it, for example the discussion of types of economic enterprise, could be dispensed with.

Related to this is the fifth point, that the style should exhibit both lucidity and brevity. The volume opens smoothly; after a while, however, one notes a certain fatigue creeping into the writing and, as is common in collaborative enterprises, unevenness. As already noted, the book is too long.

Sixth, our student insists that the authors make up their minds about the case method. Either they compile a casebook or they write a text. It is disconcerting to find a random patchwork of illustrative material.

Finally, he expects that the suggestions for further reading will penetrate the subject matter more deeply He is disappointed to find bibliographies heavy with references to other text books while omitting standard monographs.

To sum up, in a room crowded with texts for the elementary labor course this one is likely to be jostled to the rear. It will do, but it will not inspire.

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Economic Theory; General Economics

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WICKSELL, K. *Value capital and rent.* Translated by S H. Frowein. (New York: Rinehart. 1954 Pp 180 $3 50)

The German original was first published in 1893. G. L S. Shackle has prepared a foreword to this translation of it, in which he observes that it was Wicksell's mathematical equipment which enabled him ". . . to give a more precise and elegant shape to the theory of capital and interest whose main structure had been created by Böhm-

Bawerk, and to incorporate it into a general theory of the interdependent mutual determination of income shares on the principle of marginal productivity" (p. 6).

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NOTES

Edwin G. Nourse has been appointed chairman of the American Economic Association nominating committee for the current year. He would appreciate suggestions for officers for next year at as early a date as possible. Such suggestions may be addressed to him at 1785 Massachusetts Avenue, Washington 6, D.C.

The Johns Hopkins University School of Advanced International Studies in Washington, D.C. has opened an overseas branch in Bologna, Italy, to be known as the Bologna Center of the School of Advanced International Studies of The Johns Hopkins University. C. Grove Haines, professor of diplomatic history, will direct the Center and John A. Loftus will be professor of international economics. Scholars from France, Italy, Germany and Austria will make up the teaching staff. The student body will be divided equally among Americans and Europeans. The new Center will provide opportunity for qualifying American graduate students to do graduate study or field research on the four countries of Western Europe—France, Germany, Austria and Italy.

Among recent American Assembly publications of interest to economists are: *Inflation—its Causes, Consequences, and Cures,* based on research-background papers of the Second American Assembly, May 1952; *Economic Security for Americans,* background-research papers and final report of participants in the May 1953 Assembly; and a *Teacher's Manual on Economic Security,* prepared with the Joint Committee on Economic Education with the support of the Committee for Economic Development and Ford Foundation for the teaching of economic security problems in grade and high schools. Individual copies of these publications will be furnished on request to J. H. Chamberlin, Educational Director, The American Assembly, Graduate School of Business, Columbia University, New York 27, N.Y.

Deaths

Stuart Daggett, Flood Professor of Transportation, emeritus, University of California, Berkeley, died December 22, 1954.

Montfort Jones, professor of finance in the School of Business Administration of the University of Pittsburgh. Date of death not reported.

David McCahan, professor of insurance in the Wharton School of Finance and Commerce and president of the American College of Life Underwriters, died June 28, 1954.

J. Melbourne Shortliffe, chairman of the department of economics, Colgate University, prior to retirement in 1947, died December 13, 1954.

G. O. Virtue, professor of economics, emeritus, College of Business Administration, University of Nebraska, died September 9, 1954.

Appointments and Resignations

Theodore Allison has been promoted to chief of the Section of Agreement Records and Analysis in the Wages and Industrial Relations Division of the Bureau of Labor Statistics

C. Canby Balderston has resigned as dean of the Wharton School of Finance and Commerce to become a member of the Board of Governors of the Federal Reserve System.

George B. Baldwin has been appointed executive assistant to the director of the Center for International Studies at Massachusetts Institute of Technology.

Philip M. Banks has been appointed instructor in economics at the Wharton School of Finance and Commerce.

Frank Bass has been appointed assistant professor of marketing at the University of Texas.

Philip W. Bell, of Haverford College, lectured at the Salzburg Seminar in American Studies in the winter term.

Sterie T. Beza has accepted an appointment as instructor in economics at Princeton University for the year 1955-56.

Robert C. Bingham has been appointed instructor in business organization and management and economics in the College of Business Administration, University of Nebraska.

James C. D. Blaine has been promoted to professor of transportation at the University of North Carolina.

Arthur I. Bloomfield, of the Federal Reserve Bank of New York, spent the last three months of 1954 in Indochina on behalf of the Foreign Operations Administration. He also served as U.S. delegate at a meeting of an ECAFE Working Party on financial aspects of economic development.

Roy Blough, who has been principal director of the department of economic affairs of the United Nations, has been named professor of international business at the Columbia University Graduate School of Business, effective July 1955. He will develop a new graduate study program encompassing international business activities.

Joseph H. Bonneville, professor emeritus of New York University, is visiting professor of finance in the School of Business Administration, University of California at Los Angeles, in the current semester.

Philip J. Bourque, formerly at the Wharton School of Finance and Commerce, has been appointed instructor in economics at Muhlenberg College.

Ivor I. Bowen, of the University of Hull, England, is teaching at the University of California, Berkeley in the current semester.

Raymond T. Bowman and William E. Warrington have been elected chairman and secretary, respectively, of the Graduate Group in Economics in the Graduate School of Arts and Sciences, University of Pennsylvania.

Michael Brank, formerly of the University of New Mexico, has been named head of the department of business administration at Quinnipiac College.

Phillips H Brown, of the University of Missouri, has been appointed assistant professor of economics in the College of Business Administration of the University of Arkansas.

Yale Brozen has resumed duties at Northwestern University after spending the past year as visiting professor of economics at the Escola de Sociologia e Politica, Sao Paulo, Brazil and at the Fundaçao Getulio Vargas, Rio de Janeiro.

Thomas A. Budd has been named acting dean of the Wharton School of Finance and Commerce.

George Budzeika has been appointed instructor at Manhattan College

Eugene W. Burgess was visiting professor of industrial relations at Massachusetts Institute of Technology during the fall term 1954-55

John M Chapman, professor of banking, will retire from the Graduate School of Business, Columbia University, in June 1955.

Hollis B. Chenery, on leave of absence from Stanford University, is now in Pakistan with the Mission to Pakistan on Economic Development sponsored by the Ford Foundation and will then go to Italy with the Society for the Development of Southern Italy.

T Hillard Cox, formerly of the Department of Labor, has been appointed lecturer in industry and will serve as management specialist assigned to the Wharton School of Finance and Commerce project at the University of Karachi.

C. M. Crawford has resigned from the University of Florida to accept a position with Mead Johnson & Company in Evanston, Illinois.

Ben T. Curry has been appointed assistant professor of economics at Stetson University.

H. Robert Dodge has been appointed instructor in business organization and management in the College of Business Administration of the University of Nebraska.

Louis A. Dow has been appointed assistant professor of economics in the College of Business Administration of the University of Arkansas.

W. T. Easterbrook, of the University of Toronto, has been appointed Pitt Professor of American History and Institutions at Cambridge University for the session 1955-56.

Seneca Eldredge has been appointed instructor in economics in the College of Business Administration of the University of Nebraska.

C. W. Emory has resigned from the University of Florida to accept a position at Washington University, St. Louis, Missouri.

R. F. Ericson has been appointed director of the Executive Development Program at Stetson University.

William J. Fellner has been appointed Seymour H. Knox Professor of Economics at Yale University.

Rendigs Fels will be on leave from Vanderbilt University during the spring quarter to be visiting professor of economics at Stanford University.

Robert H. Ferguson, of the New York State School of Industrial and Labor Relations, lectured at the Salzburg Seminar in American Studies in the summer of 1954.

Michael T. Florinsky has been promoted to associate professor of economics at Columbia University.

Rev. Patrick W. Gearty, formerly of the College of St. Thomas, has joined the staff of the Graduate School of Social Science, The Catholic University of America.

Amor Gosfield, formerly of the Wharton School of Finance and Commerce, has been appointed associate professor in the School of Business Administration of Duquesne University.

William M. Goulding has been appointed instructor in economics in the School of Business Administration, University of Pittsburgh.

Paul V. Grambsch has been named associate dean of the School of Business Administration, Tulane University.

Arthur I. Grant, formerly of the Wharton School of Finance and Commerce, has been appointed assistant professor of economics at Rhode Island University.

Paul E. Green has been appointed instructor in economic and social statistics in the Wharton School of Finance and Commerce.

J. H. Habakkuk, Chichele Professor of Economic History, University of Oxford, England, will teach at the University of California, Berkeley, in the summer session.

Donald Hage has resigned from the University of Illinois to become associate professor of marketing at the University of North Dakota.

Donald M. Halley, who has been on leave serving as visiting professor and advisor to the University of the Philippines, has returned to his post as professor of finance and administration at Tulane University.

Daniel Hamberg, of the University of Maryland, participated in a Conference on Economic Development of Underdeveloped Areas held in Milan, Italy, in October 1954.

Richard S. Harnsberger has been appointed instructor in business law in the College of Business Administration of the University of Nebraska.

C. Lowell Harriss, of Columbia University, is serving as consultant to the New York Commission on the Fiscal Affairs of State Government.

Bert G. Hickman is on leave from Northwestern University this year to serve on the staff of the Council of Economic Advisers.

Walter E. Hoadley, Jr., has been elected treasurer of the Armstrong Cork Company.

G. Wright Hoffman, of the Wharton School of Finance and Commerce, has been named

head of a project to establish an Institute of Public and Business Administration at the University of Karachi.

Edgar M. Hoover is now working for the Office of Population Research, Princeton University, on a two-year project which the Office is undertaking with the support of the International Bank for Reconstruction and Development. Ansley Coale is associated with him in the project.

Louis Hough has resigned from the University of Pittsburgh to become head of the department of economics at the University of Toledo.

Eugene E. Jennings has resigned from the Wharton School of Finance and Commerce to accept a position at Michigan State College.

Keith W. Johnson, formerly analytical statistician in the General Services Administration, is now economist with the Pacific Gas and Electric Company, San Francisco.

Frank L. Keller has been appointed acting director of the Division of Economic and Business Research, Tulane University.

Charles J. Kennedy has been promoted to associate professor of economics in the College of Business Administration of the University of Nebraska.

Fred E. Kindig has been appointed assistant professor of industry in the School of Business Administration of the University of Pittsburgh.

William H. Knoke has been appointed head of the department of marketing in the College of Commerce in the State University of Iowa.

Henry Krauskopf, formerly of Muhlenberg College, has been appointed assistant professor at Quinnipiac College.

John P. Lutz, instructor in finance, has been assigned to the University of Karachi project of the Wharton School of Finance and Commerce.

David W. MacEachron has resigned from the Bureau of the Budget to accept a position as director of program for the United States Council of the International Chamber of Commerce.

Thomas Mayer has been appointed assistant professor of finance at the University of Notre Dame.

Alvin Mayne has resigned from the Wharton School of Finance and Commerce to become economic advisor to the Governor of Puerto Rico

Francis B. McCormick has been promoted to assistant professor at Ohio State University.

Nelson L. McElhatten has been appointed instructor in industry in the Wharton School of Finance and Commerce.

Dan M. McGill, of the Wharton School of Finance and Commerce, has been named executive director of the Administrative Board of the S. S. Huebner Foundation for Insurance Education.

Thomas P. Melady has accepted a position as a staff officer with the Foreign Operations Administration in Washington.

John B. Minick has been appointed instructor in business organization and management in the College of Business Administration at the University of Nebraska.

Glen H. Mitchell has been appointed assistant professor at Ohio State University.

William H. Nicholls, who has been on leave as a member of the Council of Economic Advisers, has resumed teaching at Vanderbilt University.

John L. O'Donnell, formerly of Trinity College, Cambridge, and Indiana University, is now assistant professor of finance at the University of Notre Dame.

Henry M. Oliver, Jr., of Indiana University, has accepted a Fulbright lectureship in Ceylon for the current academic year.

Russell O. Olsen has been appointed part-time associate professor in agricultural economics at Ohio State University.

Robert Parks has been appointed instructor in finance at the Wharton School of Finance and Commerce.

James M. Parrish has been promoted to assistant professor of economics at the University of North Carolina.

J. E. Pierce has resigned from the University of Florida to accept a position at Southern Methodist University.

A. Warren Pierpont has been promoted to associate professor of business administration at the University of North Carolina.

Wallace C. Peterson has been promoted to assistant professor of economics in the College of Business Administration of the University of Nebraska.

Gerald A. Pollack has been appointed instructor in economics at Swarthmore College.

W. M. Pritchett has been promoted from senior agricultural economist to a junior officer position of executive assistant at the Federal Reserve Bank of Dallas.

Howard G. Schaller has been promoted to associate professor of economics at Tulane University.

Edgar T. Shaudys has been appointed assistant professor in the department of agricultural economics at Ohio State University.

Steven J. Shaw has joined the faculty of Tulane University as assistant professor of marketing.

Carl S. Shoup has been named executive officer of the department of economics, Columbia University.

Abraham J. Siegel has been appointed instructor in the department of economics and social science at Massachusetts Institute of Technology.

Irving A. Sirken has joined the staff of the Program Analysis Office of the National Science Foundation.

Hayden Smith has resigned from the University of California, Davis, to accept a position in the general economics department of Standard Oil Company of New Jersey.

Robert M Solow has been promoted to associate professor in the department of economics and social science, Massachusetts Institute of Technology.

Miles H. Sonstegaard has been appointed statistician in the Bureau of Business and Economic Research, University of Arkansas.

Milton H. Spencer, formerly with Armour and Company, has been appointed assistant professor at De Paul University.

Raleigh W. Stone, professor of industrial relations in the School of Business of the University of Chicago, will retire in September 1955.

Charles Stonier has been appointed assistant professor of marketing in the Division of Business, Hofstra College.

James H. Street has been granted a leave of absence from Rutgers University for the year beginning March 1955 to serve as visiting professor of economics at the National University of Paraguay, Asuncion, under a Smith-Mundt grant.

Selig Taubenblatt, of the University of Michigan, has been appointed Ford instructor in economics at Vassar College for the current academic year.

William A. Terrill has been promoted to associate professor of accounting at the University of North Carolina.

Gerald E. Thompson has been appointed assistant professor of economics in the College of Business Administration, University of Nebraska.

James C. Vadakin has been promoted from assistant professor to associate professor of economics at the University of Miami.

Salvatore Valentino has resigned from the University of Nebraska to accept an appointment at Creighton University.

William J. Vatter, of the School of Business, University of Chicago, has been granted a Fulbright professorship to lecture at the University of Melbourne six months, beginning June 1955.

Herbert von Beckerath is leaving Duke University to go to Europe to direct research.

John T. Walter has been promoted to associate professor of statistics in the University of Pittsburgh School of Business Administration.

Donald A. Watson has been promoted from assistant professor to associate professor of economics at Coe College.

Robert M. Weidenhammer has been appointed professor of finance in the School of Business Administration, University of Pittsburgh.

Ulric Weil has been appointed assistant professor of finance in the Division of Business, Hofstra College.

Robert S. Weinberg has joined the staff of the Division of Industrial Cooperation, Massachusetts Institute of Technology, as an operations research analyst.

Howard C. Williams has been promoted to assistant professor at Ohio State University.

Roger Williams has been appointed assistant professor of economics at Baldwin Wallace College.

Charles Wolf, Jr., has accepted an appointment as associate research economist in the Institute of East Asiatic Studies and assistant professor of political science at the University of California, Berkeley.

Archibald M. Woodruff has been promoted to director of the Bureau of Business Research in the School of Business Administration, University of Pittsburgh.

Wilferd Wortman has been appointed instructor in business organization and management and economics in the College of Business Administration, University of Nebraska.

VACANCIES AND APPLICATIONS

The Association is glad to render service to applicants who wish to make known their availability for positions in the field of economics and to administrative officers of colleges and universities and to others who are seeking to fill vacancies.

The officers of the Association take no responsibility for making a selection among the applicants or following up the results. The Secretary's Office will merely afford a central point for clearing inquiries; and the *Review* will publish in this section brief description of vacancies announced and of applications submitted (with necessary editorial changes). Since the Association has no other way of knowing whether or not this section is performing a real service, the Secretary would appreciate receiving notification of appointments made as a result of these announcements. It is optional with those submitting such announcements to publish name and address or to use a key number. Deadlines for the four issues of the *Review* are February 1, May 1, August 1, and November 1.

Communications should be addressed to: The Secretary, American Economic Association, Northwestern University, Evanston, Illinois.

Vacancies

Economics, real estate, and insurance: Position open in September, 1955, for assistant or associate professor of economics. Must be able to teach real estate, insurance, and principles of economics. Position is in a small Eastern college specializing in business administration. Applicants should have a Ph.D. or an M.A. and the desire to work towards the Ph.D. Excellent opportunity for advanced graduate work in nearby institutions. P168

Business statistics: Instructor or assistant professor, Southwestern state university. Permanent position to be filled for first semester, 1955-56. Ph.D. preferred but master's degree plus experience will be considerd. Salary $4,200-$5,500 for eleven months, depending upon training and experience. Possibility of higher rank and salary for outstanding candidate. Part-time teaching and part-time statistician in the bureau of business research. P169

Private and public finance: Ph.D. with emphasis in private and public finance for a large coeducational Catholic university in the Midwest, beginning in fall, 1955. Prefer man with some institutional and some teaching experience. P170

Research in economics and investments: Large Eastern company needs a versatile research analyst to work on a wide variety of problems in an established economic-investment research unit. Requirements: At least the M.A., M.S., or M.B.A., preferably Ph.D.; good background in economics with specialization in monetary, investment, or insurance fields; the ability to write well; age not over 35; good personal appearance. This is a research position, but the man must also be able to make a favorable impression on our line executives in both written and oral presentations of his research findings. P171

Accounting, statistics, business law: A leading Southern college will have an opening in September, 1955, for a young man with, or close to, Ph D., to handle courses in accounting, statistics, and business law. Salary and rank depend upon training and experience. P172

International travel opportunity: The Council on Student Travel invites applications for short-term employment as educational directors on trans-Atlantic ships. Required: educators from the following fields: cultural anthropology, art history, international relations and economics, group work, language, philosophy, recreation, sociology. Conversational ability in one or more of the following: French, German, Greek, Italian. Ability to organize extensive educational program with the help of passenger volunteers. From March to December, 1955, the program will be conducted by the Council for students, tourists and migrants traveling aboard two large passenger ships belonging to one of the major lines. These ships sail regularly from New York to European and Mediterranean ports. Job assignments vary from one round-trip sailing to periods of 3-5 months. Compensation for these longer periods of service will be regular salary. For a single round-trip sailing, full or partial passage, depending upon job requirements. All positions allow for time abroad. For further information, application form, write to: Council on Student Travel, (0-1), 179 Broadway, New York 7, N.Y. REctor 2-0936.

Economists Available for Positions

Industrial surveys, personnel management, market research, international economics: Man, 36, Ph.D. Extensive experience with industry, government, advertising, foreign intelligence; various teaching positions; publications; supervisory, editorial, public relations, and lecturing experience. Several foreign languages. Presently employed in New York City headquarters of an international organization. Interested in more responsible position with industrial, commercial company or large university. E450

Business cycles, economic development, public control, transportation: Man, 35, M.A., Ph.D., University of Pennsylvania. Nine years of teaching experience at leading institutions; 5 years in industry. Broad familiarity with manufacturing and transport industries; good publication record. Desires teaching and/or research. E528

Principles, government and business, government and labor, economic history, regional development, comparative economic systems, labor economics, economic theory: Man, 31, married, Ph.D. Four years of teaching and 2 years of research experience; publications. Will consider any location but prefers midwest or West Coast. Seeks position for June or September, 1955. E535

Economic principles, labor, economic thought, economic history, economic systems, corporation finance, marketing, money and banking: Man, A.M., Northwestern University, Ph.D., Yale University. Fifteen years of economics teaching experience; government experience as section chief. Research project in economic history completed. Available now. E536

Economic and financial history, economic theory, public finance, money and banking, labor economics, corporation finance, investments and allied subjects: Man, 40, married, Ph.D. Now teaching at large Eastern university. Interested in teaching position or perhaps a combination of teaching and some administrative work. E542

Economic theory and principles, history of thought, public and private finance, and other subjects: Man, under 40, single, Ph.D., 1941. Experience in banking, private research, consulting, government service. Nineteen years of highly successful teaching at every level from freshman through Ph.D. program, in several types of institution, the past 7 years in a large state university, with permanent tenure. Has taught virtually every field in economics and business curriculum (except accounting and statistics), specializing in economic theory the past 7 years. Original contributions in scholarly and popular journals and in anthologies, in such diverse fields as economic theory, mortgage finance, women's fashions, and baseball. Pioneering book being published this spring; three other books, including textbook, in advanced stages. *Who's Who in the South and Southwest.* Seeks better position; minimum rank, full professor; minimum salary in South, $7,000 for 9 months, more elsewhere. Available in 1955. E543

Economics of the firm, public utilities, principles, value and distribution theory, public finance, government and business, business cycles: Man, 33, married; M.A., University of Toronto, Ph.D., University of Wisconsin. Teaching since 1945; broad occupational experience, veteran, fellowships, articles in preparation. Desires teaching or position as economist for large firm. Available in June or September, 1955. E544

Public finance, price theory, national income analysis, social control, money and banking, economic principles: Man, 30, married; Ph.D., summer, 1955. Two years of experience in a large state university teaching mainly advanced courses; 2 years of experience as an economist specializing in the analysis of prices and national income for a research division of the federal government Currently teaching. Desires teaching and/or research position. E545

Market and business analysis: Man, 33; B.B.A. and graduate work in economics, including business trends, monetary economics, national income analysis, statistics, marketing, accounting. Four years of research experience, 3 with major oil company. Statistical sales analysis, sales and population forecasting, area analysis, and product studies. Desires southern California location. E546

Financial research and analysis, industrial organization and management, market research and writing, control, budget, economic relations with Near Eastern countries: Man, 49, married; European academic background equivalent to M.A. and Ph.D. in economics, business engineering and accounting. Twenty-four years of diversified experience of which 6 in Switzerland, in banking and investment combined with financing of industrial development, control, budget, and economic research; 5 years of lecturing; written several books and studies in Europe and United States on banking, credit system, investment, and industrialization. Knowledge of several European languages and countries. Seeks position in research, writing, or teaching; also interested in investment-analyst or controller position. E548

Labor economics, industrial relations, economic analysis, money and banking: Man, 36, Ph.D., University of Chicago. Experience includes graduate and undergraduate teaching, top-level federal government position, university research, and industry. Interested in teaching and research. E549

Economic theory, statistics, money and banking, business cycles, mathematical economics, principles: Man, 32, married; B.S. (engineering), M.B.A., Illinois, Ph.D. dissertation in progress and other requirements completed, University of Chicago. Five years of teaching; strong in statistics. Currently teaching but desires change for personal reasons. Available in June or September, 1955. E552

Economic history, business history, insurance history: Man, 36, Ph.D., New York University. Fourteen years of governmental experience, including those of an advisory and administrative nature; 1 year of teaching experience. Has considerable counseling experience. Desires research, writing, or teaching position. Interested especially in collge or university teaching position. Of especial usefulness to life insurance companies as research assistant or historian. E553

Agricultural economics, money, banking, and monetary policy, price theory, labor economics: Man, 31, married; B.S., McGill, M.S., University of Illinois, Ph.D. preliminary examinations passed summer, 1954, University of Chicago. Eight years as Canadian government economist. Desires university position with combination of research and teaching. Available in June or September, 1955 E554

Marketing, economics, industrial relations, retailing: Man, 34, B.S., M.B.A., completed course requirements for Ph.D. in business administration. Business experience. Interested in teaching or research position. E555

Market analysis, finance and real estate economics: Man, 38, married; all Ph.D. requirements completed except dissertation Fifteen years of private and government experience in operations and economic research, including· analysis of business conditions; residential, commercial, and industrial market analysis; finance and real estate economics; industrial location and regional economic development; liaison with private and public groups. Available immediately for position with business firm or university research group. E556

Economics, statistics, investments, finance, and accounting: Man, 40, married; B.A., M.A., Ph.D. requirements completed except the dissertation. Ten years of teaching experience. Desires teaching or investment position. E557

Comparative economic systems, principles, corporation finance, public finance, labor, economic history, business law, constitutional law: Man, middle age; M.A., LL.B., and course requirements in economics for Ph D. recently completed at a Big Ten university. Ten years of legal and business and 6 years of teaching experience, including 3 years at university level. Is primarily interested in stimulating type of undergraduate teaching. Desires a teaching position. Available in June or September, 1955. E558

Labor economics and labor relations, national income, public finance, economic history, corporation finance: Man, 32; Ph.D., Columbia University. Three years of teaching experience in Southern university; 2 years of business research experience. Interested in teaching and some research. Available in September, 1955. E559

Economic principles and theory, money and banking, history of economic thought, international trade, business cycles, statistics: Man, 32, married; B S., M.A., close to doctorate (thesis in preparation). Five years of experience teaching economics and statistics; research and publications. Desires teaching appointment or teaching plus research. E560

Economics, banking, finance: Man, 30; B.S., M.A. Six years of diversified experience with bank supervisory agency. Seeks position with financial institution as an analyst or administrator. E561

Principles of economics, public finance and taxation, public utilities, money and banking, and related subjects: Man, 31, married; Ph.D., University of Wisconsin, 1953. One publication; 2 years at a California state college teaching large number of subjects. Desires more specialized teaching, research, or both. Available early in June, 1955, if necessary. D. M. Soule, 1228 13th St., Eureka, Calif.

International trade, money and banking, investments, market research, labor economics: Man, married; Ph.D. expected this spring. Three years of university teaching numerous fields in economics; 7 years of government research experience in cost and statistical analysis, interindustry relationships, price studies, and labor relations. Interested in teaching position or opening in private industry in management, sales engineering, or foreign trade. Available immediately. E562

International trade, comparative economic systems, urban land economics, marketing, history of economic thought, public finance, money and banking, economic history of Europe: Man, Ph.D. Research fellowships; 7 years of university and college teaching; 4 years of research in federal government. Experience as consultant; multilinguist; extensive foreign travel. Desires teaching or research position. E563

Economic theory, statistics, accounting, money and banking, private and public finance, mathematical economics, international trade: Man, 35; B.S., M.A., Harvard, plus 2 years of graduate study on economic theory and statistics. Now assistant professor of economics and special lecturer of statistics; 6 years of successful college teaching experience. Other experiences include federal government position, university and industry research. Desires better teaching position or responsible statistical research position. E564

Economic history, history of economic thought, economic theory, money and banking, business cycles, international trade and economics, economic geography, corporation finance, investments, marketing: Man, 30, Ph.D, Rotterdam. Has some teaching, industrial, and marketing experience and excellent references. Desires teaching, research, or advisory position in California Available in May-June, 1955. E565

Statistics: Man, 44, married; Ph.D. in economics. Extensive teaching experience in economics and business administration. Publications; research and consulting experience; original contribution in industrial applications of statistics. Seeks university appointment with opportunity for consulting. Now teaching in Eastern university. E566

Economic theory and principles, labor economics, labor relations, labor law, government and business: Man, 36; M.A. Three years of teaching experience at large Eastern university; 3 years of experience leading private research organization; 2 years of experience in labor relations Desires to complete Ph.D. work; seeks teaching position. E567

Marketing research, salesmanship, retailing, business cycles, money and banking, principles of economics, principles of marketing, labor relations, personnel administration, business organization and management, American industry and economic geography, foreign trade: Man, 32, married; B.A., M.B.A., Ph.D. course and written requirements completed at New York University (Graduate School of Business Administration). President of small business 2 years; former assistant professor of economics at a large Southwestern college; 6 years of college and university teaching plus practical business background Interested in position as teacher, in administration, or with industry. E568

Economic principles and theory, history of economic doctrines, business cycles, money and banking, industrial organization and control: Man, 34; B.S., M.S., M.B.A., Ph.D. (economics) in progress. Four years of varied industrial experience; 7 years of teaching experience in leading institutions; some publication. Now teaching in prominent Eastern school (business administration) but is eager to switch to major interest—theoretical economics. No limitations on location. E569



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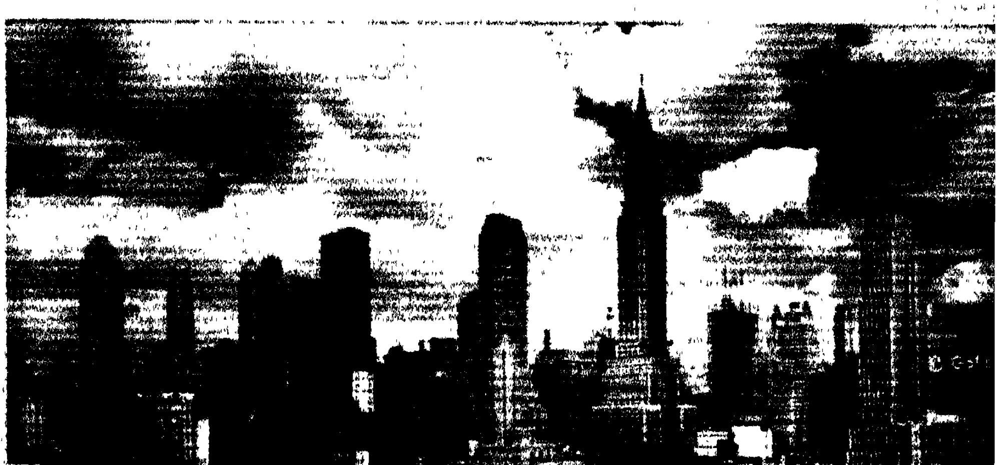
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by *G. L. Bach*, Carnegie Institute of Technology

Bach's new text aims to help students acquire: (1) the maximum amount of material in economics in the most simple and easy-to-read terms (2) a lasting interest in real-world economic problems (3) a small fundamental and rigorous tool kit for economic analysis (4) an orderly, objective way of thinking about economic policy problems (5) and the ability to use economic analysis in reaching independent thoughtful judgments on major public policy issues.

Over 100 schools have adopted this new text less than one year after publication, including: Columbia University; University of Pennsylvania; University of California, Los Angeles; University of California, Berkeley; Cornell University; Fordham University; Worcester Polytechnic Institute; Indiana University; Carnegie Institute of Technology; University of Illinois; University of Missouri. A *Teacher's Manual* is available upon adoption.

March 1954 | 6" x 9" | 720 pages

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by *Arthur Robert Burns*, Columbia University

Especially timely because of current interest in the relation between poverty in some countries and their possible political alignment, this new text employs a new approach to explain the differences in economic achievement among various countries. It presents the explanation in terms of the various aspects of scarcity that face all societies. It analyzes the diverse ways in which countries deal with their economic problems. It considers not only nations' general economic and political organization but also their access to resources, methods of organizing production, and policies concerning the distribution of income.

The approach is further distinguished in that it studies primitive, ancient and medieval societies as well as contemporary societies. For this reason, it is the most comprehensive text in its field. Divided into five parts, the text treats—in this order: differences in levels of living; production; productive resources; integration of the productive system; and consumption. Line drawings, charts, graphs, tables and bibliographies increase the text's usefulness.

Spring 1955 | 6" x 9" | approx. 800 pages

by *Herman E. Krooss,* New York University

The American level of living—how it was achieved and what its effects have been—is the central theme of this short economic history of the United States. Emphasizing the factors of production, how they evolved, what they contributed and what they received, the text evaluates the progress we have made in increasing the standard of living. With a topical approach, it explains economic development as a continuous process.

Using simple language, the text explains the nature and background of American economic history and the roles of the land, the population, the farmer, labor and the government in our economy. It studies the evolution of trade unionism, capital accumulation, the development of financial institutions and the contribution of business enterprise. Industrialization and the evolution of the manufacturing industry, domestic and foreign commerce, war, and the business cycle are also analyzed.

Spring 1955 6" x 9" approx. 475 pages

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by *James N. Morgan,* University of Michigan

Using data on consumer behavior collected by the Survey Research Center, University of Michigan, this next text focuses on consumer choices, both individual and social. It stresses the analytical skills necessary for intelligent consumer choices and interpretation of social-economic problems concerning consumer behavior. Avoiding masses of ephemeral information, the author emphasizes *sources* of information and *methods of using* information.

Starting with the choice between spending and saving, the text examines the social consequences of such decisions and discusses methods whereby a consumer can make these decisions for himself. Whole chapters are devoted to insurance against risks, medical care, and housing. In each case the individual's problems are discussed, then the consequent problems faced by the whole economy. Other major expenditures, government and other protections for the consumer, and economic problems of direct concern to the consumer are also examined. Finally, the text discusses the problem of maximizing consumer satisfaction.

April 1955 5⅝" x 8⅜" approx. 448 pages

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PAPERS AND PROCEEDINGS

OF THE

Sixty-seventh Annual Meeting

OF THE

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Detroit, Michigan, December 28-30, 1954

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Changes of address should be sent to the Secretary at the Executive Office at Northwestern University, Evanston, Illinois. To be effective, notice must reach the office by the 15th of the month previous to the month of publication. The Association cannot be responsible for copies lost due to failure to report change of address in time.

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PROCEEDINGS

PROGRAM OF THE SIXTY-SEVENTH ANNUAL MEETING OF THE AMERICAN ECONOMIC ASSOCIATION

Detroit, Michigan, December 28-30, 1954

No central theme has been sought for in the program this year. The attempt has been rather to provide opportunity for presenting results of current research, with preference in selection of papers given to the younger scholars who have not participated actively in the program in recent years.

Tuesday, December 28, 1954

10:00 A.M.
Meeting of the Executive Committee

12:30 P.M.
Luncheon Meeting of the Executive Committee

2:30 P.M.
International Flow of Economic Ideas

Chairman: V. W. BLADEN, University of Toronto

Papers: T. W. HUTCHISON, University of London; JOSEPH DORFMAN, Columbia University

Discussion: J. M. LETICHE, University of California; G. H HILDEBRAND, University of California at Los Angeles

Long-term Trends in Capital Formation and Financing (joint session with the American Finance Associaiton)[1]

Chairman: J. J. O'LEARY, Life Insurance Association of America

Papers: A. S. TOSTLEBE, Wooster College; SERGEI DOBROVOLSKY, Wayne University; M. J. ULMER, American University

Discussion: G. T. CONKLIN, Guardian Life Insurance Company; ELI SHAPIRO, Massachusetts Institute of Technology

Regional Economics

Chairman: WALTER ISARD, Massachusetts Institute of Technology

Papers: J. V KRUTILLA, Tennessee Valley Authority; F. T. MOORE, RAND Corporation

Discussion: PHILIP NEFF, University of California at Los Angeles; LEON MOSES, Harvard University; F. A. HANNA, Duke University

8:30 P.M.
Concepts of Competition and Monopoly

Chairman: CLAIR WILCOX, Swarthmore College

Papers: J. M. CLARK, Columbia University; SIDNEY WEINTRAUB, University of Pennsylvania

Discussion: FRITZ MACHLUP, Johns Hopkins University; KERMIT GORDON, Williams College; GARDNER ACKLEY, University of Michigan

Current Problems in Agricultural Economics

Chairman T. W. SCHULTZ, University of Chicago

Papers: E. O. HEADY, Iowa State College; MARTIN BRONFENBRENNER, University of Wisconsin

Discussion: D. G. JOHNSON, University of Chicago; D. R. KALDOR, Iowa State College

Models of Economic Growth (joint session with the Econometric Society)

Chairman: R. W. GOLDSMITH, National Bureau of Economic Research

Papers: STEFAN VALAVANIS-VAIL, University of Michigan; JOHN POWERS, Stanford University

Discussion: E. D. DOMAR, Johns Hopkins University; T. C. SCHELLING, Yale University

Pricing in Transportation and Public Utilities

Chairman: M. L. FAIR, Tulane University

Papers: W. S. VICKREY, Columbia University; F. K. EDWARDS, National Coal Association

Discussion: E. W. CLEMENS, University of Maryland; J. C. NELSON, Washington State College

[1] To be published in the *Journal* of the American Finance Association.

Wednesday, December 29, 1954

9:30 A.M.

Development Policy in Underdeveloped Countries

Chairman: MAX MILLIKAN, Massachusetts Institute of Technology
Papers: H. B. CHENERY, Stanford University; W. H. NICHOLLS, Vanderbilt University
Discussion: E. E. HAGEN, Massachusetts Institute of Technology; WILFRED MALENBAUM, Massachusetts Institute of Technology

Economic Stabilization, Forecasting, and the Political Process

Chairman: ROY BLOUGH, United Nations
Papers: R. C. TURNER, Indiana University; S. K. BAILEY, Princeton University
Discussion: SOLOMON BARKIN, Textile Workers Union of America; H. R. BOWEN, Williams College; R. A. LESTER, Princeton University; T. G. MACGOWAN,[1] Firestone Tire and Rubber Company

The Impact of Antitrust Laws

Chairman: R. B. HEFLEBOWER, Northwestern University
Papers: S. N. WHITNEY, Twentieth Century Fund; J. W. MCKIE, Vanderbilt University; LOUIS MARENGO, Washington, D.C.
Discussion: WALTER ADAMS, Michigan State College; S. M. LOESCHER, Indiana University; J. H. STAUSS, Grinnell College

12:30 P.M.

Luncheon Meeting (joint session with the American Finance Association)[1]

Speaker: T. O. YNTEMA, Ford Motor Company

2:30 P.M.

Economic Development: Case Studies

Chairman: ARTHUR SMITHIES, Harvard University
Papers: J. H. YOUNG, Yale University; MARVIN FRANKEL, University of Illinois
Discussion: D. H. STEINTHORSON, Bank of Canada; DUANE EVANS, Bureau of Labor Statistics

Economic Research and Public Policy

Chairman: GERHARD COLM, National Planning Association
Papers: J. A. LIVINGSTON, *Philadelphia Bulletin*
Discussion: EWAN CLAGUE, Bureau of Labor Statistics; G. W. ENSLEY, Joint Committee on the Economic Report; STANLEY LEBERGOTT, Bureau of the Budget; BERT SEIDMAN, American Federation of Labor; M. A. WATSON, National Shoe Manufacturers Association

Taxation and Income Distribution

Chairman: H. M GROVES, University of Wisconsin
Papers: D M HOLLAND, National Bureau of Economic Research; P J. STRAYER, Princeton University
Discussion: W. W. HELLER, University of Minnesota; R. E. SLITOR, Washington, D C

8:30 P.M.

Presidential Address

Chairman: I L. SHARFMAN, University of Michigan
Paper: SIMON KUZNETS,[2] Johns Hopkins University

Thursday, December 30, 1954

9:30 A.M.

Urbanization and Industrialization of the Labor Force in a Developing Economy (joint session with the Industrial Relations Research Association)

Chairman: L. G. REYNOLDS, Yale University
Papers: W. E. MOORE, Princeton University; B F HOSELITZ, University of Chicago
Discussion: G. B. BALDWIN, Massachusetts Institute of Technology; W. H. KNOWLES, Michigan State College; SIMON ROTTENBERG, University of Chicago

Cyclical Experience in the Postwar Period

Chairman: GARDNER ACKLEY, University of Michigan
Papers: RENDIGS FELS, Vanderbilt University; K. D. ROOSE, Oberlin College
Discussion: JOHN LINTNER, Harvard University; DANIEL HAMBERG, University of Maryland; E C. HALD, University of Washington

Research on the Business Firm

Chairman: H. R. BOWEN, Williams College
Papers: EDITH PENROSE, Johns Hopkins University; C. A. HICKMAN, North Carolina State College
Discussion: ALBERT LAUTERBACH, Sarah Lawrence College; W. W. COOPER, Carnegie Institute of Technology

[1] No manuscript received.
[2] Published in the March, 1955, issue of the *American Economic Review*.

2:30 P.M.

Long-term Trends in International Trade

Chairman: FRITZ MACHLUP, Johns Hopkins University

Papers: R. E. BALDWIN, Harvard University; H. G. AUBREY, Federal Reserve Bank of New York

Discussion: C. P. KINDLEBERGER, Massachusetts Institute of Technology; THEODORE MORGAN, University of Wisconsin; A. C. HARBERGER, University of Chicago

Price and Wage Flexibility (joint session with the Industrial Relations Research Association)

Chairman: R. T. BOWMAN, University of Pennsylvania

Papers: J. M. BLAIR, Federal Trade Commission; K. E. POOLE, Northwestern University

Discussion: GIDEON ROSENBLUTH, Queen's University; F. C. PIERSON, Swarthmore College

Debt Management and Monetary Policy

Chairman: L. H. SELTZER, Wayne University

Papers: M. A. ROBINSON, Dartmouth College; C. R. YOUNGDAHL, Federal Reserve Board

Discussion: A. G. HART, Columbia University; E. R. ROLPH, University of California

5:00 P.M.

Business Meeting

6:00 P.M.

Dinner Meeting of the Executive Committee

THE purpose of the American Economic Association, according to its charter, is the encouragement of economic research, the issue of publications on economic subjects, and the encouragement of perfect freedom of economic discussion. The Association as such takes no partisan attitude, nor does it commit its members to any position on practical economic questions. It is the organ of no party, sect, or institution. Persons of all shades of economic opinion are found among its members, and widely different issues are given a hearing in its annual meetings and through its publications. The Association, therefore, assumes no responsibility for the opinions expressed by those who participate in its meetings. Needless to say, the papers presented are the personal opinions of the authors and do not commit the organizations or institutions with which they are associated.

JAMES WASHINGTON BELL
Secretary

INTERNATIONAL FLOW OF ECONOMIC IDEAS

INSULARITY AND COSMOPOLITANISM IN ECONOMIC IDEAS, 1870-1914

By T. W. Hutchison[1]
University of London

I

The activities of economists—what they do and how and why they do it—are of at least as much interest and importance as the activities of the people economists themselves study: businessmen, housewives, bankers, finance ministers, and trade-union leaders. Although economists may—for better or for worse—not always have the effects on the politico-economic world around them which they intend or desire to have, they do directly and indirectly, often after long lags and much "friction," exercise some extremely important effects on various kinds of economic processes. A complete explanation of many types of economic processes cannot be given unless this explanation, or the model being used, takes account of the tides, gusts, streams, and flows of doctrines, opinions, and prejudices emanating from economists. So the study of economic processes must include the study of economists, or of the origin, flow, and development of their ideas—for one can hardly separate the study of the origin of ideas from that of the change and flow of ideas. Such a study includes as well as all the processes of changes in ideas, and how ideas originate, also the processes by which they succeed, catch on, and dominate their time; it includes also the lags and impediments in the flow of ideas, both across and within national and linguistic frontiers, and the questions of whether and in what sense there can be said to be progress in the flow of economic ideas, or whether there is a circular or pendulum movement, and how far this movement is the result to some extent of fashion—since the adjective "fashionable," in a faintly pejorative sense, is one of the most frequently encountered adjectives in our economic journals. All such questions lie in a vast field covered as yet only, on the one hand, by fairly casual unsystematized individual observations and, on the other hand, by a few wildly oversimplified and overcomprehensive generalizations (for example, the cruder sorts of Marxist generali-

[1] I am much indebted to Professor G. J. Stigler for valuable help in the conception and execution of this paper, though, of course, he does not bear any responsibility for its contents.

zation). It is in a minute subsection of this vast, amorphous, uncategorised field that this paper and this section of the Association's program, "The International Flow of Economic Ideas," belongs. It is very tempting to continue this general stage setting: indeed it would be easy to go on with the stage setting so long that there would be no time for the little play I am supposed to be putting on. But I must turn now to my allotted task and to the state of economic ideas and the international flow thereof, round about 1870.

II

In reviewing the international flow of economic ideas between 1870 and 1914, I must, from limitations of space and knowledge, take a rather Anglo-centric line, and consider primarily the flow into and propagation in Britain of economic ideas from abroad, leaving out movements and conflicts between other European centers: for example, between Austria and Lausanne and between Austria and Germany. The story seems to fall fairly naturally into two or three main phases. The first phase, in which Jevons is the outstanding figure, is that of the seventies when we have the discovery, for British economists especially, of the great French and German predecessors of marginal analysis—Cournot, Dupuit, von Thünen, and Gossen—some twenty, thirty, or forty years after the first publication of their works. At the same time we have also the contemporary interchange between Jevons and Walras. After something of a lull in the eighties, towards the end of which the ideas of the leading Austrian economists first became widely known in England, we reach in the nineties the high point in our period of the cosmopolitan interchange and development of economic ideas, notably concerning the theory of the consumer and the theory of marginal productivity. In this international interchange of the nineties English economists play a certain part, but not relatively a very large or leading part. Then in the final phase, from the nineties down to 1914, contemporary with the predominance of Marshall and his school, the flow of economic ideas into Britain from abroad, and their acceptance and appreciation, dries up very considerably, although there were still, all the time, many new ideas and refinements being advanced in Lausanne, Italy, Austria, and Germany, notably on the subjects of the consumer, welfare, interest, money, and business cycles.

The marginal utility theory of value was not, of course, discovered in 1871-74. Both the component ideas (especially that of the relation between utility and value but also that of the marginal concept, as well as the combination of the two ideas in the marginal utility theory of value) had had a number of previous expounders. The years 1871

to 1874 are simply the time from which hindsightedly and *ex post* we can recognize one of the major fundamental turning points in economic ideas: first, there follows the widespread application of the marginal concept especially to microeconomic maximization formulae; secondly—and this applies to Britain only—we can date in 1871 the end of roughly a century of that perhaps slightly overconfident, doctrinaire, and distorted Anglo-classical overemphasis on the role of labor and cost of production in value; and we have something of a return back to the mainstream of balanced European thinking about value since Aristotle, in which a full and explicit role for the demand side had never been long or seriously left out of account.

The three men of 1871-74 were not reacting to, or stimulated by, any common cosmopolitan intellectual situation brought about by an active international interchange of ideas about the problem of value (or any other economic problem). In fact, for several decades there had been hardly a trickle, much less a flow, of economic ideas into Britain from elsewhere, and of course the internal flow of ideas in Britain itself had almost completely dried up. In the judgment of the most orthodox and overwhelmingly influential authorities, the subject of value had been settled once and for all. I think it can be said that the more narrowly economic theories in Mill's *Principles of Political Economy* show hardly any positive traces of any idea from any French, Italian, German, or Austrian source, except in regard to J. B. Say's theory of markets (and certainly *not* in regard to Say's quite sensible treatment of value and distribution). Though J. E. Cairnes wrote a critical essay on Bastiat, from his *Leading Principles* (1874) it appears that pretty well no one outside Britain had ever had an idea on the central doctrines of economic theory that was worth mentioning (apart, again, from Say's theory of markets). Senior had been to some extent a notable exception. He had studied Hermann's work and had derived from it at least a certain confirmation or encouragement in his departure from some of the main doctrines of Ricardian orthodoxy. If, of course, J. S. Mill had had time in the rather brief periods he later devoted to political economy to study what Taussig described as "the incisive and original" work of Hermann, with its "high intellectual quality," he might have been moved to rethink his ideas about the wages-fund doctrine some thirty-seven years before he eventually did so. Of course some of the "underground" English utility theorists such as Banfield, and perhaps Jennings, had learnt from European economists. In fact, to call attention to the work of Hermann and Rossi (J. B. Say's successor in Paris) had been the proclaimed primary intention of Banfield's lectures at Cambridge in 1844. But as regards the orthodox and overwhelmingly dominant treat-

ment of the fundamentals of economic theory, the position for a quarter of a century or more before 1871 could have been summed up in the celebrated London newspaper headline: "Fog in the English Channel, Continent Isolated." As Taussig put it: "The insular condition of social and political speculation in Great Britain in the middle of the century, and the stagnation of economic thought in particular, prevented a breath of influence from reaching English thinkers." (*Wages and Capital*, page 266.) Though this generalization may or may not be questionable as regards social and political ideas, it is surely well founded with regard to economic theories. We might, however, mention in passing one peculiar but vastly consequential case of the international flow of economic ideas that was taking place in mid-century in the British Museum library; that is, the discovery by Karl Marx of a framework for his economic doctrines in the works of Smith and Ricardo.

Thus with the international flow of economic ideas virtually at a standstill, the three men of 1871-74—and this applies to Menger and Walras as well as to Jevons—each reached his discovery by his own original and mainly national route. There is, therefore, quite a measure of coincidence in the almost simultaneous publication of their ideas by Jevons, Menger, and Walras, though the increasing occurrence of the isolated publications of the marginal utility idea, or of ideas pretty near it, made such a double or treble coincidence in dates almost inevitable sooner or later. And. of course, there is in any case nothing of a coincidence in the fact that this threefold, nearly simultaneous, publication, by three university professors, became recognizable in retrospect as that major turning point when enough force was finally generated gradually to get started a cumulative process sufficient to mark what can be seen now as the opening of a new period in economic thought. For such a major shift to get under way, at first very gradually, some such threefold spark was necessary. None of the numerous previous isolated individual flashes had been enough to get an ideological chain reaction or cumulative process started, or to get the torch burning sufficiently steadily so that it could not be neglected or quenched. As Walras proudly reported to his aged master Cournot in 1874: "M. Jevons et moi avons amené la question à un point tel qu'elle ne pourra bientôt plus être écartée par les économistes."

Let me develop rather further and qualify slightly this generalization about the separate national settings in which Jevons, Menger, and Walras developed their ideas. Jevons' marginal utility theory was the fruit of his own originality stimulated by his study of Lardner, Bentham, and perhaps Jennings. Through Lardner there came from France possibly some extremely diluted and selective traces of Cour-

not's monopoly analysis. Menger's theory was the product of his own originality building mainly on the works of Hermann, Schaeffle, and other Germans, including perhaps Mangoldt. And Walras was indebted to his father, to his father's classmate Cournot, and, of course, beyond that to the traditional current of French thought on value and distribution going back through J. B. Say to Turgot, Condillac, and Galiani. These extremely brief and familiar statements do really seem to summarize all that is worth summarizing, and it would be pointless, and perhaps even quite misleading for our purpose, to explore much further. Though there may well have been other particular institutional influences relatable to the ideas of Jevons or Menger or Walras, *separately,* we can only think of one *institutional* influence which may have been common to the background both of Jevons and Walras, and which was present in the first economic problem Jevons wrote about, that of the railways of New South Wales, at the same time as he was studying Lardner's book on *Railway Economy.* This institutional influence may at a later stage perhaps have to some extent acted on Walras through Dupuit, though Walras does not seem to have studied Dupuit till well on in the seventies and then not, at first at any rate, to have appreciated the significance of his work. This common institutional background influence was that of the growing problems, in the second half of the century, of the pricing policies of public utilities especially in transport, with their large fixed and comparatively small variable costs, where the divergencies between marginal and average cost and marginal and average revenue were so important and inescapable. For those who hanker after some "exogenous" explanation of the development of marginal analysis (that is, an explanation in terms of the problems and institutions of the contemporary economic world), there is this consolation prize, such as it is. But the discovery, and above all the subsequent elaboration, of marginal analysis is surely an example of a predominantly "endogenous," logical, intellectual development out of the internal theoretical problems of economic analysis itself, at a considerable level of abstraction. It has also been argued that the marginal utility theory was developed as a bourgeois counterblast to Marxian economic theory. Though subsequently Wicksteed, Böhm-Bawerk, and Pareto made some use of the subjective theory in this way, there does not seem to be even a grain of truth in this argument applicable to the original triumvirate of 1871-74, or to their motives, conscious or unconscious.

The increase in the international flow of economic ideas in the seventies—slight and qualified as compared with what came later but very marked as compared with what had gone before—may be traceable to two interconnected and mutually reinforcing factors. First,

there is the relatively much more abstract mathematical nature of the new ideas on value, and, secondly, there is the gradually increasing importance of the academic scholar in the world of economists and the increasingly professional intellectual status and standards of the pioneers of marginal analysis and of the whole neoclassical period. The marginal formulae were very easily susceptible to mathematical modes of expression; that is, to formulation in an international language. Obviously today *Econometrica* (though in some ways the least intelligible of our magazines) is clearly the most cosmopolitan and internationally or interlinguistically the most intelligible. Jevons' enthusiasm for the mathematical method may perhaps seem today a little quaint considering his comparatively very elementary use of it. But Marshall, of course, knew just what he meant and was making a significant comparison with previous economic theories when he wrote of the work of Carl Menger—ironically a virulent opponent of the mathematical method—that it, "though not making use of the mathematical language is distinctly mathematical in tone" (*Principles*, first edition, page 149). Secondly, with economics becoming increasingly a subject for university scholars, it became more widely regarded as a duty, if not universally followed as a practice, to explore and refer to work in other languages by way of a professional scholarly obligation not felt or fulfilled to the same extent by the often less academic political economists of preceding generations. The example of German scholarship was of some importance here.

We may take as marking the opening of this new international flow of economic ideas the moment in May, 1874, when Walras and Jevons exchanged letters, though Jevons had read Walras' work a short time before they corresponded. I cannot fix with precise certainty when it was that the works of Menger or of other Austrians were first noticed in England or outside Austria and Germany. In any case, Jevons never saw Menger's work, and certainly no considerable or wide attention was paid to any Austrian ideas in Britain till the second half of the eighties. But it was in 1879 in the Preface to the second edition of his *Theory of Political Economy* that Jevons set new standards of cosmopolitan scholarship and intellectual receptiveness, especially for British economists, by searching out with unprecedented conscientiousness all the works of predecessors and contemporaries which had anticipated or shared in his own new ideas. This Preface is, in its new standards of scholarly presentation, almost as outstanding and novel an achievement, in its way, as his ideas on marginal utility had been in the first edition. Of course there had some time before been McCulloch's historical and bibliographical work. But the bibliographical listing of all known writings on political economy and its various

branches is something quite different from the international documentation of a particular new idea, not only in its origins but in its contemporary treatments, such as Jevons achieved in his Preface. The former is largely an *ex post* record; the latter serves much more to create a contemporary international market in ideas and to make advances in the subject to some extent a process of international co-operation.

Cournot, Dupuit, Gossen, Léon and August Walras, von Thünen (and incidentally William Whewell, of Cambridge) are here all given, in some cases absolutely their first recognition by an English economist, in others certainly their first sympathetic and illuminating reference in English. Jevons threw open the windows on a whole vast new landscape of economic ideas, including the writings of one or two of those now recognized as among the most fundamental seminal pioneers in the history of the subject. Naturally Jevons himself did not, and could not reasonably have been expected to, take in anything like the full significance of the vast range of work of the half-dozen great economists he presents.

There is one detail here over which we should like to linger for a moment, and that is the slight mystery which seems to hang about Jevons' reference to the work which some economists might take today to be the greatest and most original of all pioneer achievements; that is, Cournot's *Recherches*. The question arises as to who was the first economist in Britain to appreciate something of the vast significance of Cournot's *Recherches*. Jevons says in his Preface (page xxix): "This work must occupy a remarkable position in the history of the subject. It is strange that it should have remained for me among Englishmen to discover its value." This statement seems as it stands to be inaccurate, and rather curiously inaccurate. Twenty to thirty years later, Marshall was to write to J. B. Clark that "I fancy I read Cournot in 1868," and Keynes says that the *Recherches* "must have come into his hands some time between 1867 and 1870." This of course gives Marshall a priority Jevons could not have known about, except—and it is curious that Jevons did not seem to have noticed this—that Marshall did make a single fleeting mention of the *Recherches* in his article, prominently published in the *Fortnightly Review* in 1876, on "Mr. Mill's Theory of Value." But it is certainly true that no one could have appreciated from Marshall's passing reference the vast significance Cournot's book was having both for Marshall's own work and for all subsequent economic thought. Another rather curious question is posed by Jevons' mention that the man who had put him on to the possible significance of Cournot was the mathematician Todhunter, who was, or had recently been, a fel-

low of St. Johns—Marshall's own college. Todhunter himself had not seen the *Recherches*, but in 1875 suggested its significance to Jevons, who had obtained a copy in 1872 without studying it carefully till some years later. Now it is ruled out that it was Marshall who put his fellow Johnian mathematician Todhunter on to Cournot, because Todhunter is quoted by Jevons as writing that "when I have mentioned the title, I never found any person who had read the book." Were these two fellow Johnians, both interested in the application of mathematics to economics, not on speaking terms? It is indeed an oddity for students of the flow of ideas, international or national, that the width of the high table at St. Johns College was, apparently, for a few years at any rate, a sufficient impediment to the propagation in Britain of the ideas of one of the outstandingly original and consequential writers in the history of economic thought. So here with regard to the discovery of Cournot in Britain is a further point of contention for protagonists—if there are any left—of the relative priorities and achievements of Jevons and Marshall. Anyhow, it is certain that Jevons first fully brought Cournot's work (as well as Dupuit's, Gossen's, von Thünen's, and Walras') prominently and inescapably to the attention of British economists. Marshall on the other hand had been quietly studying Cournot some years before, but before 1890 made one single fleeting reference in 1876 to the work which had, as Marshall himself put it, "directed the forms of my thought." We might add that it seems possible that the full significance of Cournot's work was first appreciated in America before it was in Britain. Anyhow, as Professor Dorfman has pointed out to me, Simon Newcomb in his review of Jevons' *Theory of Political Economy* in the *North American Review* for 1872, while warmly welcoming Jevons' work (in this respect being almost alone among Jevons' reviewers in English) nevertheless places it well below the supreme class which he considered Cournot's *Recherches* to occupy—which work was obviously thoroughly well known to and appreciated by him. Jevons gives no sign, as far as I know, of ever having seen this remarkable review of Newcomb's, though Newcomb is mentioned in Jevons' Preface to his second edition of the *Theory*.

The international flow of economic ideas set going by Jevons and Walras was followed by something of a lull in the eighties, which, at any rate in Britain, seems on the surface to have been rather a lean period, though it was, of course, in this decade that Marshall's *Principles* was being written and though Edgeworth's *Mathematical Psychics* of 1881 was soon to have an important international influence. The eighties are, however, the great decade of the original Austrian triumvirate, and towards the end of it their works—thanks

to Smart, Bonar, and others—became widely known in Britain and elsewhere. In the early nineties, Böhm-Bawerk's two volumes and Wieser's *Natural Value* appeared in English translations, as had Pantaleoni's *Pure Economics* in 1889, a work in which the Austrian influence was strong. So far as I have ascertained, these, with the possible addition of Cassel's *Nature and Necessity of Interest,* are the only major neoclassical translations into English in our period. (The Fisher edition of Cournot in 1898 is in rather a different category, as are the English editions of Marx.)

Towards the end of the eighties and through the nineties, we come to the peak decade in the flow and interchange of ideas in the neoclassical period. We have the development of the marginal productivity theory of distribution, which had of course its English and German predecessors but which was now perfected, refined, and widely accepted. We have also a new analysis of consumers' equilibrium and new debates over the theory of capital; and all these advances are carried through by a wide international exchange of ideas. In their writings of that decade or of a few years previously, Edgeworth, Wicksteed, Auspitz and Lieben, Wieser, Böhm-Bawerk, Wicksell, Walras, Pareto, Barone, and Fisher all drew on a broad, internationally known literature, made up to a large extent of their own writings. Works like Wicksell's *Value, Capital and Rent* and Pareto's *Cours,* though they contain their own particular original ideas, are constructed essentially on the basis of a wide, eclectic, cosmopolitan reading of their contemporaries and immediate predecessors. The marginal productivity theory was, therefore, developed in a very different setting to that in which the marginal utility pioneers of 1871 had worked out their ideas. We must omit the details of this decade, but we must call attention to one fact. Although Edgeworth and Wicksteed made very important contributions to the international development in the nineties of the theory of distribution and though to a considerable extent they followed Jevons in the international breadth of their reading and comprehension of contemporary European writings, patches of fog were again noticeable over the English Channel and the Continent was again partially isolated. There were important ideas, first broached in Europe in the nineties or soon after the turn of the century, on the subject of the theory of the consumer, of welfare or "ophelimity" economics, of interest, money, and business cycles, which were not to find a reception in Britain for the best part of two, three, or even four decades. I refer of course to what are now recognized as some of the most celebrated contributions to economics of Walras, Pareto, Auspitz and Lieben, Fisher, Wicksell, Spiethoff, Mises, and Schumpeter.

III

How did this reaction come about? After Jevons had, shortly before, opened up such great vistas in respect of French and German economic ideas, how and why was it that a so much more stay-at-home regime so soon supervened in Britain? We must first get an idea of the restricted extent of the flow of economic ideas from abroad after the early nineties. After 1893 there was, in the period we are concerned with, no further translation into English of any major neoclassical book of economic theory (except for Cassel's on *Interest,* already mentioned). One might have imagined that the establishment of the specialist *Economic Journal* in 1891 might have marked a renewed attempt to expand and maintain, in the tradition of Jevons' Preface, the flow of ideas from the Continent which, as we have seen, was then almost teeming with new developments in one branch or another of economic theory. Edgeworth, the editor, was certainly a greater master of languages, including the international language of mathematics, than Jevons had been, and kept in close, though not always very sympathetic, touch with Austrian, French, and Italian economists. But either for Edgeworth's own reasons or because he deferred to the judgment of his senior colleague, the *Economic Journal* in what it included and what it excluded (especially in what it excluded) cannot be said in our period to have contributed notably to the international flow of economic ideas. Looking through the volumes of the first twenty-five years, we find a single article a piece by each of the three leading Austrians, Menger's being on the subject of money, with certainly quite extensive reviews of the new works of Wieser and Böhm-Bawerk. But we find no article by Walras nor a single review of any work by him, though—as Professor Jaffé has shown me that his correspondence reveals—Walras was most keen that all or some of his work should appear in English and actually pressed it upon Edgeworth. No contribution from Barone appears, though according to a letter of his to Walras, which Professor Jaffé has kindly informed me of and copied out for me, he submitted an article on marginal productivity at Edgeworth's request only to have it rejected. "Ma note n'a pas le bonheur d'être agreé pas le pontiffe des économistes anglais, M. Marshall, et le pauvre M. Edgeworth s'est trouvé dans l'embarras!" Pareto contributes no article and he appears only once briefly as a reviewer in 1912 and once as a "reviewee"—as regards his *Cours* in 1896. There is a single famous article by Wicksell in 1907, which seems to have roused very little attention or understanding at the time, and when his *Lectures* were published in German in 1913 they were dealt with in a single twenty-line paragraph. It is true that when in the years just before the first

World War the business cycle became increasingly the subject of systematic study in Britain, some—often rather critical—notice was taken of the writings in French of such predecessors as Tugan-Baranovsky and Aftalion, though the ideas of Spiethoff and also of Schumpeter hardly received the attention which in subsequent decades they have been recognized as deserving.

How are we to explain these considerable limitations to the flow of economic ideas into Britain, this lack of interest in and receptiveness to many of the best ideas of Walras, Pareto, Wicksell and others—many of them ideas which in the decades since seem to have won out as among the best of their time? We can only try to indicate some of the broad considerations and factors.

By 1900, the superstructure of neoclassical marginal analysis was complete in its main outlines, and a considerable measure of unification and agreement had been fairly easily reached as to this superstructure of formulae. That part of the main outline where nothing like agreement or unification was attained and where these were, of course, far more difficult of attainment concerned basic philosophical or methodological questions: for example, regarding the mathematical method, and regarding the utility and social utility concepts. These differences regarding the utility concept still persisted, and they led to diverging analyses of the consumer and to some extent of welfare economics, which if not very different in their conclusions—they were in any case pretty well void of empirical content—were based on very different concepts and techniques. Separate analyses thus came into being, divided by a quagmire of philosophical-methodological conundrums and terminological dogmas over which no agreed bridge could be constructed. Here were issues certainly not capable of any easy, generally acceptable resolution by the precise international language and criteria of mathematical or quasi-mathematical analysis, such as had served to produce the more or less common agreed superstructure. Moreover, the spectacle of the recent Austro-German *Methodenstreit* was certainly not one which could arouse much hope of enlightenment through an international debate of the methodological issues at stake.

Moreover, at the opening of this century that curious intellectual-psychological-sociological phenomenon, the Academic School, was at the height of its influence, cohesion, and prestige, with its two outstanding examples, the Austrian and Marshallian Schools, which were also, of course, largely national schools. Though much of the superstructure of their systems could be and was presented in easily reconcilable terms, these "school" systems rested on tenaciously maintained, if not always energetically explored, terminological dogmas, con-

cepts, and philosophical presuppositions, which turned them somewhat into impermeable, monolithic, intellectual structures in the nature of ideologies, insusceptible to modification or adjustment by any piecemeal give-and-take of ideas, national or international. The Austrian School, though by no means monolithic in all its doctrines, was agreed as to its original leaders in its vigorous rejection of all forms of mathematical analysis and expression. Menger and Böhm-Bawerk even rejected such a fundamental mathematical notion as that of the mutual determination and interdependence of economic quantities, and held dogmatically to a sort of monocausal theorizing which prevented the intellectual bridges being built over which a mutual permeation of their system of thought with the systems of Marshall or Lausanne could have come about. Those Austrians who were sympathetic to mathematical methods or receptive to non-Austrian ideas, such as Auspitz and Lieben and Schumpeter, soon became more or less outcasts from the Austrian School proper.

On the other hand, the Marshallian School held both to a number of well-known but specifically Marshallian concepts and assumptions, as well as to a sort of attenuated Anglican utilitarianism, or "utility-arianism," which it was not considered worth while to explore beyond, argue over, or re-examine. In his recent review, Professor Sir Dennis Robertson recognized this topic "on the face of it as of some importance," but as one, he goes on, which "when I started to read economics at Cambridge in 1910, it was not, I think, fashionable among us to think much about. . . . To us, I think, it seemed a topic more suitable for discussion by Germans than by Englishmen. We thought we knew pretty well what sort of things we wanted to know about, and were glad enough to take the counsel given by Marshall himself near the beginning of the *Principles*, 'the less we concern ourselves with scholastic enquiries as to whether a certain consideration comes within the scope of economics the better.'" (*Utility and All That* [1951], page 14.) British economists under the leadership of Marshall who followed out this line of approach were naturally cut off from much interest in economic ideas and analysis, whether emanating from Germans or from others, which proceeded from different conceptions of "what sort of things we wanted to know about," or, for example, from different conceptions of the significance and legitimacy of the utility and welfare concepts.

After 1890, Marshall's *Principles* and his school of thought soon rose to a position of almost complete and exclusive domination in Britain, and the considerable limitations in the international flow of economic ideas as far as Britain is concerned are more or less closely

bound up with what Professor Pigou has called "the Marshallian dictatorship." I certainly do not wish to suggest anything in the nature of a black-and-white contrast between the generous cosmopolitanism of Jevons' Preface and the tendency to insularity or exclusiveness of the Marshallian school of thought. In fact, a wide and cosmopolitan exploration of French and German writings in his first few formative years as an economist, during which he had found his way to the works of Cournot and von Thünen, then scarcely known in Britain, had of course contributed centrally and essentially to Marshall's *Principles*. In fact, it was mainly through the *Principles* that Cournot's and Thünen's ideas became a generally recognized part of economic doctrine. But the Marshallian school of thought thereafter proceeded in a somewhat insular independence of the work of Walras, Pareto, Wicksell, and the Austrians, treating Cournot and Thünen as something of a once-and-for-all import which is was hardly necessary to follow up once the *Principles* had been launched.

The explanation of this attitude would seem to be somewhat as follows. The economic ideas which will readily flow internationally are the sort of precise abstract mathematical or quasi-mathematical formulae which Marshall considered to be a very small part of economics proper and in isolation apt to be misleading. As Keynes put it, "Marshall arrived very early at the point of view that the bare bones of economic theory are not worth much in themselves and do not carry one far in the direction of useful, practical, conclusions." The theoretical skeleton had to be covered, clothed, and brought to life by a complement of historical and descriptive economics which was inevitably subject to a considerable national relativism, particularly if the ultimate objective—the guidance of policy—was kept in view. Moreover, Marshall considered that a more or less adequate abstract analytical "organon," as he called it, had been created and, as Mr. Harrod has said, "his programme of work for them [his pupils] was to study the workings of the economic system in all their rich and varied detail with the aid of principle; it was a programme for the development of applied economics." (*The New Economics*, edited by S. Harris, page 65.) Theoretical innovations, imported or otherwise, were rather a waste of time; it was all in Marshall.

Moreover, Marshall wanted a system of economic principles which would obtain and hold the interest of the statesmen, civil servant, banker, and industrialist, expressed in a language they could understand and invoking familiar British names or authorities. His emphasis on the continuity of the national tradition in economics obviously had much to do with this ambition. An architect might in fact be basing his

plans on the latest revolutionary continental principles of construction, but in selling an architectural design to the Bank of England, at least till fairly recently, he would have had a much better chance of success if the novel constructional principles employed were concealed behind a homely, familiar façade in the style we know in Britain "as Bankers' Georgian" (in America, "Bankers' Colonial") than if exposed in some stark unfamiliar un-British construction in the style of the Bauhaus, or Corbusier. Walrasian and Paretian importations, with their mathematics and their foreign terminology of "ophelimities" and "technical coefficients," would simply have frightened off those who Marshall rightly or wrongly regarded as the prospective readers of his *Principles* and of the new *Economic Journal.*

It seems that it is on some such lines as these that the case for the insularity of the Marshallian school of thought would have to be made out. I would be delighted if someone with more understanding of that case than I have were to make it out more effectively.

IV

It can hardly be expected that a summary of conclusions will yield any very firm, precise, or novel points. However, we can see from our survey that just as, by and large, there will be more international exchange the more active national economies are, so the flow of ideas internationally became more active when in each of the national centers more new ideas were forthcoming. Again, just as graded or precisely standardized wheat will usually be traded internationally rather than loaves of bread, so the international exchange of ideas came about mainly in formulae of pure analysis easily susceptible to precisely standardized mathematical expression. We can see also that the development of economics as an academic discipline, carried on increasingly and mainly by university teachers, led, on the whole and with considerable and sometimes glaring exceptions, to the recognition of standards of scholarly presentation requiring a more extensive and systematic acquaintance with serious new work, whatever its language or country of origin. On the other hand, the emergence of powerful local academic schools, representing monolithic doctrinal systems, with their tenaciously held philosophical or methodological presuppositions, terminological dogmas and war cries, held up the flow of ideas between different centers, or at any rate prevented their mutual permeation, modification, and agreed unification. Finally, much depended on the personal intellectual tastes and psychology of the main leaders.

The problem today is very different. With the vastly increased number of translations and of widely circulating specialist journals,

including international journals, and with the increasingly mathematical character of advanced economic analysis, it seems, on the whole, very unlikely that good new ideas, whenever or wherever they do arise, will not have a reasonably fair chance of being heard and of making their way. I am speaking, of course, simply of the world this side of the Iron and Bamboo Curtains. The problem today is probably not whether there has just been published a *Recherches* of Cournot or an *Interest and Prices* of Wicksell, the vast significance of which will eventually come to be generally recognized and followed up by about the time of the 1990 meeting of this Association. The problem is probably not that there are Cournots among us whom we are failing to recognize but rather that Cournots are just not coming into existence at all. The question is whether by one of those typical paradoxes of improved organization and larger scale, which in the moral and social cosmos so often empty out babies with bath water, the very expansions and refinements of intellectual machinery which have removed former lags and impediments in the flow of ideas have not at the same time removed one of the former sources of original new ideas. In the period we reviewed, much that was new and vital came first from those whose main interests, or from those some of whose main interests, were outside economics (like Cournot and Dupuit and even to a different and lesser extent like Jevons and J. S. Mill), from intellectual frontier types, or from slightly crankish outsiders (like Hobson and Johannsen). Vastly increased specialization and the disappearance of independent incomes has to a considerable extent removed this kind of thinker, who was so fertile in the period we have been considering. Economists are now part, even often from their undergraduate years, of large, organized, internationally-linked academic machines, with their subjects closely organized and defined and their questions and categories ready formulated, and the problem that arises is whether at the same time a main source of stimulus to intellectual advance, even though it was one which almost inevitably operated often only after long time lags, may have disappeared. It is quite impossible to assess the answer to this sort of question of hypothetical opportunity cost, but perhaps the question is worth asking all the same. Adam Smith, though extolling the productivity of the division of labor in manufacturing industry, was very apprehensive as to some of its applications and results in other spheres.

Much, inevitably, has been said about Marshall in this paper; so let us conclude with a typical quotation from him, which bears on our point and on much else besides and which radiates wisdom like the expanding ripples from a stone dropped in a still pool: "The widening range of standardised methods [in science] tends generally to increase

the dependence of the creative mind on large capitalistic aid in obtaining scope for its activities. . . . The fact that Aristotle, Newton and Cuvier would have much to learn, if they should meet a mediocre student of modern science on his arrival in Hades, does not tell entirely on the side of the present age." (*Industry and Trade*, pages 242-243.)

THE ROLE OF THE GERMAN HISTORICAL SCHOOL IN AMERICAN ECONOMIC THOUGHT

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Just as American economic thought has affected developments abroad, so have foreign streams left an impress on the American scene. The British stream of ideas has been by far the dominant one. But then the American cultural heritage is predominantly British. This is especially true of the political and economic institutions—the basic conditioning forces. To unfold the highly complicated story of the naturalization of British economic thought on American soil would require much more than one session. Let me restrict my address to a more manageable foreign stream. Let me take the German Historical School which was especially influential in the seventies and eighties. In the broad flow of history, this movement was a contributory force to the renaissance in American intellectual life that accompanied America's great industrial revolution in the post-Civil War era.

As they envisaged the promise of America's industrialization, enlightened men were anxious to avoid the ills that disfigured England's factory and machine age and threatened the Anglo-American tradition of liberty. In an effort to cope with the pressing economic issues of the new era, progressive-minded economists began to question the adequacy of traditional, classical economic theory which dominated America in a vulgarized form. They sought ways not only to explain but also to fructify the economy and build up social wealth. They were concerned, not only with analysis, but—in an incipient way of course—with social engineering.

Technically the origins of the German Historical School go back at least to the middle of the nineteenth century, but it received a strong impetus from the intellectual revolution symbolized by the name of Darwin and the effort in all fields to assimilate the doctrine of evolution. So far as the Anglo-American world is concerned, it was a movement to do for economics what Sir Henry Maine did for English jurisprudence in correcting the overanalytic emphasis of the dominant Austinian School by an infusion of historical and comparative methods. This was not the old-fashioned history, hardly distinguishable from belles-lettres but the new history that was concerned with detailed, objective inquiry. It was in this atmosphere that the German Historical School makes its appearance in America.

We may begin with a formal event. In 1877, the Trustees of Columbia appointed the German-trained Richmond Mayo-Smith to develop economics on an inductive basis. They hoped he would follow in the footsteps of Continental European pioneers who "brought together . . . the . . . information . . . gathered by the statistical bureaus of the several governments, and have sought to infer . . . the system most favorable to industrial development, to growth in national wealth and to the fairest and most equal distribution of the rewards of labor."[1] Here was the formal acceptance of the German Historical School in the academic world.

The school—or more properly, members of the school—had come to the attention of Americans in various ways. There were, of course, the American students who had studied in Germany. Even before that movement took on large proportions, there was knowledge of the school through English and French periodicals which were widely read in the United States. There was also the deep interest of some American economists in statistics and therefore in the techniques developed by the Germans. For example, as early as 1863, Samuel B. Ruggles, as the official American delegate to the International Statistical Congress at Berlin, expressed his conviction that "abstract theories and historical traditions doubtless have their use and their proper place, but statistics are the very eyes of the statesman, enabling him to survey and scan with clear but comprehensive vision the whole structure and economy of the body politic." A few years later, at the next Congress, Ruggles met and was deeply impressed by Ernst Engel, head of the Royal Statistical Bureau of Prussia and one of the most famous economists of Europe. His Bureau was unique in that it included a "seminary" to train university graduates who qualified for admission to the higher branches of the civil service. In this way, governmental offices, like the Statistical Bureau itself, would become laboratories of political science. Engel was deeply interested in social problems. He visited England to study labor conditions in the most advanced industrial nation. He was one of the promoters of the organization of German economists in 1872—the Union for Social Politics—that apparently first gave prominence abroad to the Historical School. The organization espoused social reform along English precedents and was soon confronted by hostile critics, who nicknamed the members *Katheder-Sozialisten* (Socialists of the Chair). Rumors soon circulated abroad that the organization advocated socialism, supported breaking of labor contracts, and favored strikes.

The picture was obscured abroad by the general lack of knowledge of German economics. To overcome this difficulty in England, the

[1] Cited in Joseph Dorfman, "The Department of Economics," in *A History of the Faculty of Political Science of Columbia University* (New York, 1955), pp. 170-171.

Fortnightly Review published an article in 1873, written by Professor Gustav Cohn, on the state of German economics. Cohn pointed out that the Union was influenced by the widespread revolt in the learned community against the highly abstract reasoning of the eighteenth century with its emphasis on natural rights, state of nature, laws of nature. They insisted on the need to understand "the facts which preceded the modern state of society" before any reasonable conclusions concerning the future could be drawn. These economists were, he continued, affected by the success of the inductive method in the natural sciences and the progress of a philosophy which asserted the authority of society and the organic character of the state against the workings of extreme laissez faire.

Two years later, the same magazine published a review article that set off a controversy in the United States over the German Historical School. Wilhelm Roscher, the patriarch of the school, had just published *The History of German Political Economy.* Professor T. E. Cliffe Leslie of Queen's College, Belfast, in the review defended the school against the charge of being socialistic. In this essay he said:

> Man, in the eyes of the historical or realistic school, is not merely an "exchanging animal" . . . with a single unvarying interest, removed from all the real conditions of time and place—a personification of an abstraction; he is the actual . . human being . . . history and surrounding circumstances have made him, with all his wants, passions, and infirmities.

He pointed out the wide range of the publications by members of the German Historical School and insisted that:

> A great diversity of opinion is to be found among the economists of this school . . . ; some being conservative and others liberal in their politics; but no revolutionary or socialist schemes have emanated from its most advanced Liberal rank. Their principal practical aims would excite little terror in England. Some legislation after the model of the English Factory Laws, some system of arbitration for the adjustment of disputes about wages, and the legalization of trade unions under certain conditions, are the main points in their practical program.

Leslie's essay attracted the attention of the *Commercial & Financial Chronicle* of New York. In a eulogistic editorial it declared that the new German school treated the forces that caused a nation to grow in wealth. Interest in the school was stimulated by another eulogy which appeared at the same time in a French organ, *Revue des Deux Mondes.* The article was written by the eminent Belgian economist, Émile de Laveleye. He fanned the flames of controversy by contending that the erroneous belief in natural laws strengthened the opposition to bimetallism and protectionism, both of which, he argued, were essential to business prosperity.

This brought the *Nation* into the arena, a journal which exercised the greatest influence on respectable opinion. The editor, E. L. Godkin, was a firm adherent to the creed of free trade and the gold standard. He wrote an editorial asserting that the new group of German economists

were erudite university teachers with little public experience and long accustomed to accepting militarism and bureaucracy. In fact, they were socialists. Immediately the *Nation* received protests from several of its prominent readers.

One defender of the school was W. F. Allen, of the University of Wisconsin, who had studied in Germany. He was an orthodox Ricardian in his foundations. He strongly opposed, however, the extreme laissez faire of the dominant economics. It is all very well, he said, to point out the socialistic tendencies and the disastrous effect of public poor relief, for example, but after all was it proper for the state to "suffer its citizens to die of starvation in open day"? ("Fawcett's Essays," in the *Nation,* September 25, 1872, page 204.) He was, therefore, in sympathy with a school which he felt accepted the foundation laid by Adam Smith but built a new structure on it.

The *Nation* conceded that the German economists were not socialists but insisted that they had been blinded by resentment against the incidental, wild speculation of the prosperous era, which unification had brought to Germany.

The following year the controversy was intensified by the attack of the French economist, Maurice Block, which appeared in translation in the *Penn Monthly.* In the name of the "scientific school," he denounced the German Historical School and Leslie as "empirics" seeking to substitute sentiment for principle and holding that "the state . . . should conduct everything, direct everything, decide everything." Leslie asked the *Penn Monthly* to reprint a small extract from his article, "On the Philosophical Method of Political Economy," which would show that far from being an opponent of the philosophical spirit, as Block had claimed, his object had been to explain what the philosophical method ought to be. The journal decided to reprint the essay in full, because "it . . . represents a real advance in the development of economic science."

In 1878, with the aid of Allen, John J. Lalor, a sound money and free trade journalist, brought out the English translation of Roscher's famous *Principles.* This was immediately attacked by William Graham Sumner, who presented the view of dominant orthodoxy. Sumner stated that the work was distinguished by its pervasive faith in the state. History and statistics could not be merged with "dogmatic economics" but were separate disciplines.

Nevertheless, interest in the school continued to grow. John Kells Ingram, of Trinity College, Dublin, gave an important address before the British Association for the Advancement of Science in 1878. Ingram condemned the extremely abstract method of current English economics and declared that the study of the economic phenomena of society

should, in accordance with the historical method, be systematically combined with that of the other aspects of social existence. He pointed out that the essentials of the method were presented by the Secretary of the Union for Social Politics. Adolf Held, a student of Engel, had published elaborate inductive studies in taxation. He warned against too abstract theorizing on tax incidence and against overestimating the income tax as the sole means of reaching the entire taxable capacity. At the moment, Held was attempting to meet the challenge of socialism by supporting an advanced program of social security that culminated in Bismarck's legislation of sickness, accident, invalidity, and old age insurance. Ingram presented Held's standpoint in his own words:

1. The new school . . . opposes . . . the view . . . that the production and acquisition of wealth by individuals is the single . . object of human life; wealth, it regards as a means used by Humanity in its struggle towards moral ideas of life, and for the furtherance of universal culture

2. It . . . seeks to understand present economic phenomena through the study of their historical development, and to ascertain them as accurately as possible through statistical investigations. It uses the knowledge of the nature of man's intellect and will for the rational explanation of economic facts, but does not construct those facts themselves out of one sided assumptions respecting the nature of man.

3. It . . . recognizes the right of the state to positive intervention in the economic relations of the community, for the support of the weak and the strengthening of public spirit. As the Political Economy of the last century applied itself chiefly to the liberation of the economic forces from antiquated and useless restrictions, so the new school specially meets the acknowledged need of new social arrangements, the need of social reform in opposition to social revolution on the one hand and to rigid *laissez-faire* on the other.

4. It takes up, therefore, a less isolated position in relation to the other Moral and Political Sciences

In a quiet way the school had already struck root. Already in 1875, Colonel Carroll D. Wright, chief of the Massachusetts Bureau of Statistics of Labor, had introduced Engel's law of consumption. He drew upon Engel's studies to make a comparison of the condition of the workmen in Massachusetts with that in other states and foreign countries. Wright went a step beyond Engel and concluded also "that the higher the income . . . the greater the saving, absolutely and proportionately." Thanks to Wright, the study of family budgets was developed which, whether in the form of "Engel tables" or "Engel curves" has become so pivotal in economic analysis in our day. Engel also influenced Wright's fundamental work on the structure for a price index which has provided the statistical substance for many far-reaching decisions, such as adjustment of wages to cost of living. Inspired by Engel's success in training statisticians, Wright successfully promoted among American colleges the establishment of courses in statistics.

The German influences were summed up by Wright himself. The new school, he exclaimed, "bids fair to include on its roll of pupils the men in all civilized lands who seek by legitimate means, and without revolution, the amelioration of unfavorable industrial and social relations." *(The Relation of Political Economy to the Labor Question*

[1882], page 13.) The rigidly orthodox promptly castigated Wright as being infected by the socialists of the chair who stress moral forces and ignore the primitive and more elementary force of self-interest. Wright, however, continued to plead for social reform, in terms of the idiom of the Historical School. Thus, while the United States Commissioner of Labor in 1893, he described the German social legislation as a brave attempt to reduce economic insecurity.

Equally receptive to the school was a scholar who was to become the country's foremost economist and statistician, General Francis A. Walker. He insisted that the classical economics, as formulated by John Elliot Cairnes, furnished the skeleton foundation for sound economics, but he questioned the wage-fund doctrine and supported international bimetallism. Walker castigated the reigning orthodox economics for its extreme conservatism. He observed their neglect of historical methods, and their overemphasis upon an a priori method which achieved a simplicity in classification to which the subject matter was not susceptible. These factors, he said, in 1879 had cost the science of economics public regard, especially among the laboring classes. As a remedy for this, the Historical School, it seemed to him, offered the greatest promise. "The economists of Germany, Italy, Belgium, and France," he wrote, "are doing the work which Adam Smith began, in his spirit, but with larger opportunities and a wider and ever widening view."[2]

The movement reached a high pitch in the eighties, especially under the impact of English writings, that opened up the field of economic history. Indicative of the temper of the times was the fact that the article on "Political Economy," in the ninth edition of the *Encyclopaedia Brittanica* (1885), was prepared by Ingram; and the *Encyclopaedia,* of course, was an authority here as well as in England. The essay was quickly reprinted here for use in college classes, largely through the efforts of F. W. Taussig.

The Historical School was scoring, again because an ever increasing number of college graduates were going to Germany for advanced work in the seventies and eighties. Germany had long been known as the land of scholarship, a land where, it was said, professors achieved a "degree of perfection . . . that astonishes the world." (F. W. Taussig, "College Graduates in Germany," in the *Nation,* April 2, 1885, page 275.) And it was pointed out in 1876 by Charles F. Dunbar, of Harvard, that the lead in economics had now passed from England and France to Germany.

The young men who went to Germany were imbued with a lively

[2] Walker, "The Present Standing of Political Economy," 1879, reprinted in Walker, *Discussions in Economics and Statistics,* Vol I, edited by D R Dewey (New York, 1899), p. 318.

interest in statistics. A number who studied with Engel and his assistant, August Meitzen, at the Royal Statistical Bureau, achieved considerable prominence. Henry Carter Adams became the first statistician of the Interstate Commerce Commission and devised its pivotal accounting system which served as a model for the regulation of public utilities here and throughout the world. Roland P. Falkner was the first man to hold a leading American university post devoted exclusively to statistics, at the Wharton School of the University of Pennsylvania. He prepared the translation of Meitzen's *History, Theory, and Technique of Statistics*. His work on the famous Aldrich Report of 1893, *Wholesale Prices, Wages and Transportation,* was one of the landmarks in statistical investigation. Richmond Mayo-Smith became the outstanding teacher in statistics, and turned out such students as Walter F. Willcox and the inventor of the electrical tabulating machine, Herman Hollerith.

Another area which left a definite impress on American students was the systematic treatment of public finance or, as the Germans called it, the "Science of Finance," a subject which the English had neglected as comparatively unimportant. Interestingly, in line with this emphasis, the American pioneers in the field followed a German precedent in substituting the term economics for political economy, as the more comprehensive term. Political economy was restricted to private finance, or the domain of voluntary association. The term public finance covered the "wants of the state and the means by which they are supplied." Political economy and the science of finance became branches of economics. (See Joseph Dorfman, "Henry Carter Adams: Harmonizer of Liberty and Reform," introductory essay in Adams, *Relation of the State to Industrial Action and Economics and Jurisprudence* [New York, 1954], page 13.)

Students were also impressed by the scope of national economy covered in the massive works of such leaders as Roscher and Adolph Wagner. For example, comprehensive instruction was given, not only in principles, but also in agriculture (including forestry), transportation, commerce, manufactures, and finance. It was under this impact that Adams urged the need for a course on "American Technics" which would comprise the contributions of agriculture, manufacturing, and transportation.

To clarify the nature of the influence of the German Historical School, let me discuss specifically five German-trained economists who were the leading promoters and the first officers (along with Walker) of that landmark in the development of economic thought in America, the American Economic Association.

J. B. Clark (in "Unrecognized Forces in Political Economy," the

New Englander, October, 1877, page 712) warned that the assumed man of orthodoxy "is too mechanical and too selfish to correspond with the reality; he is actuated altogether too little by higher psychological forces."

E. J. James was more positive. He attracted attention through his contributions to the authoritative *Cyclopaedia of Political Science, Political Economy, and of the Political History of the United States* (1883-84). His articles ranged from the "History of Political Economy" and "Finance" to "Banks of Issue" and "Factory Laws." In the spirit of his German training, he declared that factory legislation could be justified, not only as protection for the helpless, but as an essential movement in the interest of society. To quote: "A state has other and nobler ends to follow than the accumulation of mere material wealth. . . . Moderate wealth and happy homes are better than a degraded proletary and ability to underbid all competitors in the industrial world."

Richard T. Ely was the most provocative of the group. He had not only studied in Germany but found it desirable to spend there a good part of each of the three years, 1911-13, in order to complete his most substantial book, *Property and Contract*. On his return in 1880 from his first trip to Germany he found academic openings scarce. Forced "to wander about the streets of New York . . . in a most wretched desperate state," he vowed to "use every opportunity to benefit those who suffer."[3] After a year and a half he obtained a foothold at Johns Hopkins. To aid in devising the best methods of carrying out proposed reforms and executing the laws, he lectured on the "Principles and Practices of Administration with Special Reference to Civil Service Problems and Municipal Reform." City planning, the mother of modern planning, likewise owes much to Ely. He was deeply impressed with the efficient administration of German cities by a permanent civil service which included the highest officials. A considerable advantage of a civil service, he wrote in 1880, was the permanence and steadiness of policy. Plans could be laid for a number of years and carried out gradually as a city could afford to execute them.

While still fresh at Johns Hopkins, he published widely read studies on the "new political economy." He granted that the older political economy had considerable merit. It separated wealth from the other social phenomena for special study. It showed the impossibility of understanding society without investigating the processes of the production and distribution of goods. In serving to pull down outworn institutions, it answered satisfactorily the needs of the latter part of the eighteenth century and the early part of the nineteenth century, but

[3] Ely to Labadie, August 14, 1885, in "The Ely-Labadie Letters," edited by Sidney Fine, *Michigan History*, March, 1952, p. 17.

like the French Revolution it was negative. Not least among the merits of the new view, Ely said, was that it gave a more concrete interpretation of economic history, by attempting to understand past doctrines in the light of their environment. He especially commended Wagner for his statement of the three ethical principles underlying economic policy. The first was the principle of individualism. This was modified by the social principle which acted through the state. Finally, there was the "caritative" principle—the principle of brotherly love expressed in voluntary action on behalf of others. Charity was only one form. The principle softened the rigors of life in ways that the social principle could not, for it was not obliged to operate according to fixed rules. Ely also noted Wagner's program for comprehensive social security that would eventually include protection against unemployment during hard times. Ely's emphasis, as early as 1882, on the acceptance of German social legislation, was prophetic. "It behooves . . . Americans to follow diligently the course of these experiments," he stated, "for we may be sure the same social problems which now vex Germany, will one day confront us." ("Bismarck's Plan for Insuring German Laborers," in the *International Review,* May, 1882, page 526.) To this end, he, along with Henry Farnam, later promoted the American Association for Labor Legislation.

Ely also pointed out that government regulation of industry provided the means of effectively applying the inductive method, for the legislation necessitated the systematic gathering and classification of data. He got John R. Commons and other students to prepare the famous *History of Labour in the United States*. In his widely used *Introduction to Political Economy*, Ely not only presented Engel's law, but called attention to Engel's basic objective "that it might be possible by a careful study of a sufficient number of family budgets for a period of years to construct a sort of *social signal service*"; in other words, "that changes in total expenditures and in expenditures for various items in a sufficient number of typical families could enable one to predict the coming of industrial storms."

Henry Carter Adams, though he found the Germany of Bismarck's day an example of efficiency and enlightened reform, warned against the dangers to liberty implicit in indiscriminate state intervention. He admired the German methods of study and their skill at systematization, but he was disturbed by their worship of the state. This lay at the heart of his warning, in speaking of German university training. "It is not possible," said Adams, "for an instructor whose lectures are worth the hearing to separate himself from the peculiar influence of his time and immediate environment, and in Germany especially do the lectures one hears upon political sciences reflect the bias of German local and

national policy." ("Political Science in German Universities," in the *Michigan Alumnus,* January, 1899, pages 137-138.) On the other hand, Adams was also disturbed by the workings of unrestrained private enterprise in America, which in another century, he felt, would contradict the theory of freedom and destroy the government. "From this dilemma must arise," he said, "an American Political Economy—an Economy which is to be legal rather than industrial in its character." ("The Position of Socialism in the Historical Development of Political Economy," in *Penn Monthly,* April, 1879, page 294.) In this he was deeply impressed, as he wrote in 1878, with Wagner's view that the tendency in economic study was towards jurisprudence.

Adams noted the need for forest conservation, and he pointed out that corporations could not undertake such a task because the fruits of the investment were too remote. In the famous monograph, *Relation of the State to Industrial Action,* he declared that there were two important functions that the government could perform in the industrial area. First, the state could raise the ethical plane of competition. For example, factory legislation need not curtail competition, but it could remove serious abuses in the factory without eliminating the benefits of individual action. Second, the state may realize for the public good the benefits of monopoly. For this purpose, Adams developed the principle of "increasing returns" to cover industries which lend themselves to public control; for example, the railroads.

Government control, Adams argued, would not necessarily lead to corruption. Corruption was due to the lack of correlation between the public and private functions. The inducements offered in the two varied widely. Extension of the state's functions, manned by a well-paid civil service, would restore the harmony between state and private service, for it would bring social distinction, the chance to exercise one's talents, and the pleasure of filling well a responsible position.

Factory legislation and monopoly regulation, however, did not touch the problem of the rights and duties under which work is done. This brought Adams, in 1886, to the need of building up a common law of labor relations, through collective bargaining.

Explicitly building on Held, Adams contended that in the scheme of petty industry, the regime of tools, the ordinary rights of personal freedom, secured to men an enjoyment of the fruits of their labor. In the great industries of today, however, the laborer was dependent upon the owner of machines, of materials, and of places for the opportunity to work. It followed that laborers must unite or they would surely get the worst of any bargain. Underlying labor's demands was the "idea" that the laborers had some right of proprietorship in the industry to which they gave their skill and time. Thus collective bargaining and the labor

contract envisaged a crystallization of a common law of labor rights which was in full harmony with the development of Anglo-Saxon liberty.

Finally, E. R. A. Seligman did much to clarify the objectives of the Historical School. He said, in 1883, that the difference between the orthodox school and the modern German school was not between deductive and historical methods. The exclusive use of either led to absurdities, producing an unreal science or a body of archeological facts. A judicious combination of both was the only permissible procedure. The chief point of difference was that the orthodox had an atomistic, individualistic point of view; the other had a social standpoint. The orthodox posited the universal spirit of self-interest; the other stressed the "multiplicity of motives which cannot be jumbled together in the phrase, 'desire for wealth.'" It emphasized, also, the importance of legal systems and historical causes and the close connection between ethics and economics as sister moral sciences. Seligman felt that only extremists would deny any value to the views of those on the other side. He called attention, however, to the "practical use to which the bald, unqualified, and therefore untrue theories" have been put in late years. For example, the so-called "scientific socialism" of Lassalle and Marx was the "logical conclusion from the premise that labor is the cause of all value, and many of Mr. Henry George's wild fallacies are traceable to an almost superstitious acceptance of the Ricardian law of rent." The state, concluded Seligman, had a duty to interfere where free competition ends disastrously, and "where the powers of state themselves are threatened . . . by corporate monopolies." ("Sidgwick on Political Economy," the *Index,* August 16, 1883, pages 75-76.)

Despite the numerous attacks on it, the "new school" had made its way. In the seventies and eighties, it furnished a rationale for combating the arrogant individualism of the time. Its emphasis on history and statistics was a powerful force in developing these mighty instruments for the expansion of economics. Its impact is epitomized in the statement of principles of the American Economic Association on its formation in 1885:

1. We regard the state as an agency whose positive assistance is one of the indispensable conditions of human progress.
2. We believe that political economy as a science is still in an early stage of its development. While we appreciate the work of former economists, we look not as much to speculation as to the historical and statistical study of actual conditions of economic life, for the satisfactory accomplishment of that development.
3. We hold that the conflict of labor and capital has brought into prominence a vast number of social problems, whose solution requires the united effort, each in its own sphere, of the church, of the state, and of science.
4. In the study of the industrial and commercial policy of governments we take no partisan attitude. We believe in a progressive development of economic conditions, which must be met by a corresponding development of legislative policy.

Having given so much, let us take something away. The statement of principles was in a few years dropped. For a while there occurred an overwhelming emphasis on the doctrine of marginal utility as the key to all economic analysis. Interestingly, the German-trained contingent was the first to welcome Jevons' theory as a part of the new economics (Clark attributed his own version of marginal utility to the inspiration of his German teacher, Karl Knies), but they had hardly intended that economics should be restricted to this doctrine, a development which was accelerated by the popularity of the translations of the nonmathematical, "Austrian" works. The creation of chairs of economic history, sociology, and social ethics tended to remove from economics the issues that had made the Historical School a vital force, especially the concern with the moral problems presented by industrial changes.

We are ready to sum up. From the beginning, the Americans followed the German Historical School in a discriminating fashion. They distinguished between its methods and its political philosophy. The first they adopted with enthusiasm, and made it an enduring feature of American economic thought. They diversified their scientific study. They developed new realms of interest, such as public finance, railroads, agriculture, labor, and the history and significance of technological and legal relations. They kept alive a serious interest in the systematic treatment of "commercial crises." They enriched economics with historical and sociological material. It became difficult henceforth to discuss even the most abstract doctrines without reference to statistics, history, and environment. Yet Americans adapted the attitudes of the German Historical School to their own traditions. For the Germans, the organic character of society was reduced to a question of action by a centralized and almost dictatorial state authority. This is not what organism meant to the Anglo-American mind. The national state was not the only embodiment of society. In the United States, particularly, there was a multitude of state and local authorities. There were, in addition, entities of a social or economic sort that exercised organic functions. In the new doctrine, therefore, as transformed by the Anglo-American mentality, doctrinaire individualism was modified or corrected by the encouragement of the powers and functions of a great many aggregates. This spelled the fundamental distinction in political outlook between the Historical School in its native land and its American heirs.

DISCUSSION

J. M. LETICHE: The papers presented by Professors Hutchison and Dorfman constitute an important event in the history of our discipline, for to my knowledge this is the first appearance of research which has been conducted expressly and systematically on the international flow of economic ideas. It is an appropriate occasion to raise general questions about a great deal rather than particular questions about a little. Why is the international flow of economic ideas a problem? What are the contributions and hypotheses which emerge from this new research? How are they relevant to the economist in the twentieth century? These are the three questions to which I shall direct my attention.

To what Professors Hutchison and Dorfman have said as to why it is a problem, I wish to add here only the following comments. The study of the international flow of economic ideas deserves particular attention for its possible contribution to the future rate of development of our science, both within and across national and linguistic frontiers. Among nations of the noncommunist world, the state of economics in the mid-twentieth century appears to be distressingly fragmentized particularly along national lines. In the communist dominated world, this field adds no support to Soviet claims of discovery. Since the second World War, the United States has become an important exporter of economic ideas, but as yet we know little of the relation between this exportable product and the altered form which it takes in new intellectual and institutional environments. We face the problem of adjustment from the role of a net importer to that of an expanding exporter of basic research. The impact of this adjustment upon our own scientific advance is of great importance. Recent appraisals of our science by Professors Schumpeter and Robbins reveal no strong ground for complacency. Schumpeter asserts that the theory of our time is greatly superior to the theory of 1900 as regards technique. He writes in his recently published *History of Economic Analysis:* "Results are more reliable, proofs are more rigorous. This in itself also means *more* results and more *specialized* results that fit better the endless variety of the configurations of economic reality. At the same time it must be admitted that fundamentally new ideas have been almost wholly absent. We make much more of the ideas which we have inherited from the preceding period and often present them in a new light, but we have added little to them." (Page 1145.)

Robbins in his book, *The Economist in the Twentieth Century* (pages 1-17), notes that in the last fifty years important contributions have been made in the general theory of money and output. He agrees with Schumpeter that development in the applied fields has been remarkable. I think we all recognize, however, that, while our profession has witnessed much advance in the techniques of economic analysis (i.e., in economic history, economic theory, statistics, and economic sociology) and that within limits they have proved their practical usefulness, the deficiencies of our knowledge are

lamentable and must continue to be a source of embarrassment. Research on the nature of the development of economic ideas and their international impact is, therefore, long overdue.

Professor Hutchison has shown that between 1871-74, Jevons, Menger, and Walras reached similar conclusions with respect to marginal utility analysis without, for the most part, reacting to, or being stimulated by, any common cosmopolitan intellectual situation brought about by an active international interchange of ideas about the problem of value or any other economic problem. In effect, they reached their discovery by their own original and mainly nationally independent routes. This discovery represents yet another important case study of advance in analytical economics which revealed inadequate former technique. Many of our intellectual resources would be freed if it were recognized once and for all that the development of our science cannot be explained in deterministic terms or on grounds of the author's "politics" or "what he stands for."

There has been a continuous, though somewhat zigzagged, development in techniques per se. I shall argue in a moment, however, that another branch of growth had different roots, has been more complex and probably more important for the international flow of economic ideas.

Regarding the increase in the international flow of economic ideas which occurred in the 1870's, Professor Hutchison says that it may be traceable to the abstract or mathematical nature of the new ideas on value and to the gradually increasing importance of the academic scholar. These factors were probably important, but I doubt whether economic ideas expressed in nonmathematical terms are less likely to obtain an international hearing than those expressed in mathematical terms. The opposite experience has probably been the case as illustrated by the fact that Adam Smith used not a single mathematical or highly abstract term. Yet English editions and translations of the *Wealth of Nations* appeared in Ireland, the United States, Denmark, Holland, France, Germany, Italy, Spain, and Russia within approximately twenty-five years of its publication.

Professor Hutchison observes that the intellectual ferment, considerable cosmopolitan interchange, and significant development of economic ideas that occurred generally in the early 1890's are to be matched only by the insignificant inflow and development of ideas in England during Marshall's predominance. Hutchison suggests that England's insular independence of the work of Walras, Pareto, Wicksell, and the Austrians was primarily the result of Marshall's emphasis upon "historical and descriptive economics which was inevitably subject to a considerable national relativism," particularly if guidance of policy was kept in view. Hence Marshall emphasized the continuity of the national tradition in economics and relied on familiar British authorities and modes of expression. Certainly these national elements played their role, but I submit for your consideration a more general, complementary hypothesis. Whenever a great synthesis is achieved in economics it results in a reduction of intellectual ferment, of controversy, and of national as well as international flow of economic ideas. When one regards Marshall's superb analytical insight, his wide range of information, and, above all, his strong

sense of proportion and relevance, is it at all surprising that he overpowered the economics profession of his generation? Adam Smith also appears to have either overwhelmed or chloroformed his critics. From the publication of the *Wealth of Nations* in 1776 to the founding of the *Edinburgh Review* in 1803 there was a barren period in the development of our science.

While the importance of a free international flow of economic ideas cannot be overemphasized, the general conclusion that I draw from Professor Hutchison's and Professor Dorfman's research is that during the periods analyzed parallel development of economic thought occurred independently in Britain and the United States with relatively little foreign influence. Professor Hutchison tells us in his book, *A Review of Economic Doctrines—1870-1927* (1953, page 67), that "Ricardo, Mill, Cournot, Thünen, Jones and Roscher, representing the English classical system, mathematical analysis, and the historical approach, gave the background from which Marshall started." Walter Bagehot also had a strong influence. Marshall's insistence upon retaining the proposition that the quantities of the factors of production are not given, but are functions of their rates of remuneration is an important difference between the Marshallian and the Austrian system, and obviously follows the British classical tradition.

In his third volume on *The Economic Mind in American Civilization, 1865-1918*, Professor Dorfman cites ample evidence for the contention that in each new generation the economists of the United States "remained fresh in their approach" and carried the ideas of their predecessors a step forward, "bearing witness to the need of change and adaptation in a dynamic economic order." (Page xii.)

I agree with Professor Dorfman's statement about the influence of the German Historical School on American thought, but, as he has written, men such as Simon Newcomb, a professor of mathematics in the United States Navy and Johns Hopkins University, were greatly influenced by Jevons and even more so by Cournot as well as by the German Historical School. Moreover, Jevons was a man who had won a reputation by the excellence of his work in applied economics. His *Serious Fall in the Value of Gold* and his brilliant *Coal Question* met the most rigorous standards of the antitheoretical school. His statistical methods were superior to those devised by the German Historical School.

Professor Dorfman's citations of the German authors concerning the position of the English classical school on such matters as "Induction vs. Deduction," "man not being merely an exchangeable animal," excessive beliefs as to "natural laws" and harmonies, "universal spirit of self-interest," etc., may have dispelled silly notions held by some American economists. But they are either irrelevant or erroneous as an interpretation of Adam Smith, David Ricardo, Nassau Senior, and John Stuart Mill.

It is questionable whether there was any economics as a professional science in the United States prior to the 1880's and 1890's. Previous to that time even in the oldest American universities economics was taught in departments of philosophy or social science. The basis of scientific development cannot come from abroad. Domestic economists can save years of work by

utilizing foreign developments if they are prepared to understand the foreign contributions and if the environment is sufficiently conducive to carry the science forward. Even within a country, economic theories become obsolete, perhaps more often and more rapidly, because the questions which they were designed to answer are no longer of interest rather than because new techniques are developed or new insights lead to detection of error in their inherent logic. Given the different national objectives and various institutions of different countries, this phenomenon appears to be even more important in the development of economics through the international flow of economic ideas. For example, the reception of neoclassical thought in the United States was dominated by the work of Marshall. Yet Taussig, though influenced by the German Historical School, followed a strong American tradition, emphasizing facts and verification. This admittance of theory with an empirical orientation was an important American contribution to economic thought. I believe that the emphasis upon empirical research was to a great extent an endogenous phenomenon stemming from the historical and institutional needs of the American environment. The early work of W. C. Mitchell and W. I. King and of the National Bureau of Economic Research represented the real foundation of empirical research on business cycles and national income in the United States. Empirical market research is another illustration.

In the twenties the saving-investment formulations came primarily from abroad, as did the output employment analysis in the thirties. Yet in each case some parallel work was going on in virtually all the important national centers of economic research.

Since the later thirties and particularly since the second World War, original contributions have been stemming to an ever greater extent from America. By this time great American economists were working at home, and a large number of younger economists had been trained in an environment where controversy and new ideas were welcome. Research is long overdue on the role that migration of people as compared to ideas and techniques has played in the development of scientific knowledge, as well as in economic progress. In his theory of class circulation, Pareto spoke of the role of abstract reason and stratified thought in the development of science; he maintained that the lack of mobility among classes results in stratification of thought, and conversely (see Vilfredo Pareto, *The Mind and Society*, edited by Arthur Livingston, Vol. III, pages 1419-1432, and Vol. IV, pages 1740-1915). In the thirties we witnessed the migration of probably more than half of the best trained Austrian and German economists to the United States. Others came from Hungary, Poland, Czechoslovakia, etc. They served as a great catalytic agent and added greatly to the American scientific output and to the international flow of economic ideas. Recent work in the theory of games, activity analysis, input-output analysis, and oligopoly is associated with the names of some of our most distinguished economists who came from abroad. There is danger that this factor may be exaggerated, since being foreign, their work stands out; but the fact is that they would not have been able to make their great contributions had the American environment not been receptive to their ideas. Their research has to a large extent

been affected by the experiences and problems of the American profession as well. The result of this interchange can be seen by comparing the quality of their output with that of the few good economists who remained in Germany.

The international flow of economic ideas that deal with general theory or technique per se is for the most part neutral to political boundaries. Those ideas pertaining to more specific "models," based on more particular assumptions, recognize national frames of reference. The latter may be utilized to great advantage if wisely applied to the national environment, but pitfalls will be encountered if they are transplanted indiscriminately. The menace of the "ideological approach" to the international flow of economic ideas (as typified by communism and fascism) rests in the fact that it is largely a pathological phenomenon, based neither on economic technique per se nor on national frames of reference. These three categories require clarification by research with respect to the form and effect of the contemporary international flow of economic ideas.

There is important precedent as well as current relevance for the correspondence of the reception of new ideas and the freedom of the environment into which they flow. To the economist in the twentieth century, the international flow of economic ideas is pertinent for at least the following reasons.

The greater the difference between the national objectives of one country and another the less general is the application of economic principles. This fact raises the problem of developing economic ideas which are or can be made more relevant to the various objectives of other countries in the noncommunist world so that they will contribute to the integration rather than the further diversification of those objectives.

American economic thought does not appear to have much relevance to economists in some European countries; for example, to those of France and Italy, not to mention those of underdeveloped areas. I submit that American economists will have to deal to a greater extent with problems of political economy if they are to obtain a more productive hearing abroad; for otherwise there is danger that our friends will look elsewhere. The premises and objectives of a good deal of American economic thought do not appear to be applicable to the problems of many nations of the free world.

The most significant obstacle to the development and the international flow of economic ideas does not seem to be the problem of the disappearance of "frontier types" coming from other disciplines, as argued by Professors Hutchison and Dorfman. I believe that the past half century has produced economists who in analytical power and originality compare well with any other period in the history of our science. The trouble today is that our science is badly compartmentalized. Our writing has become more aesthetic than communicative. As economic theorists, economic historians, econometricians, etc., we appear to be somewhat insulted if anyone understands us. The difficulty appears to be that collectively we know too much for any one of us to know very much. The progress and the international flow of economic ideas is in the future much more likely to depend upon greater synthesis

and upon the application of new general tools of knowledge within the economics profession rather than upon additions coming from other disciplines.

The United Nations, the exchange of persons program, and our educational foundations have greatly assisted in the international flow of economic ideas. Fundamentally, however, basic research is an individualistic phenomenon. It will continue to progress most rapidly in those national environments where genuine scholarship, with its characteristics of spontaneous curiosity, dispersed accident, and free controversy, can best endure.

George H. Hildebrand: As these two excellent papers both show, the history of economics can be interesting both as history and as economics.

From the standpoint of history, both authors are concerned with the dissemination of certain key ideas in economic thought. They are aware that this problem requires more than the establishment of dated sequences, important as these happen to be. Actually, the task belongs to the realm of cultural anthropology. Essentially it involves the processes of geographic diffusion of strategic conceptions, though not the simple type of diffusion originally suggested by Mr. Grafton Elliot Smith.

There is first the question of determining which economists initially proposed significant new departures in thought, at what times and in what places. This leads naturally to the second step: to what extent were the innovators really innovating and to what extent were they drawing upon earlier and more fragmentary suggestions? As Mr. Hutchison says, for example, Jevons and Menger both advanced their main ideas of marginal utility in 1871, each working in isolation. Walras followed, also independently, in 1873 and 1874. Yet all three had a substantial, if mixed, intellectual inheritance at their disposal. Major items in the bequest were the psychological principle of satiety and the notion that demand was an inverse function of price. The donors were Bentham, Jennings, Cournot, A. Walras, Dupuit, Hermann, and Gossen. Drawing upon Usher's theory of invention, I suggest that Jevons, Menger, and Walras performed the work of creative synthesis, generalizing, unifying, and extending formerly isolated and largely neglected ideas. No doubt they were in some degree inspired by a crisis in technical thought, in which they were driven to reject rather than to defend outworn ideas.

This leads to the next main question: the diffusion and circulation of the innovators' major intellectual productions. Partly this is a matter of the geographic distribution of ideas. Obviously distribution is fostered by travel and study abroad, familiarity with languages, and international dissemination of published materials. Professor Dorfman has aptly illustrated these processes, in his interesting account of the influence of the ideas of the German Historical School upon American economic thought after 1870. However, there is another side to the question, well indicated by Mr. Hutchison. It concerns the barriers rather than the channels to effective distribution of new modes of thought. Partly these barriers have been linguistic. Indeed, the obstacle to the circulation of the main contributions to marginal analysis, with the notable exception of Wicksteed, was unfamiliarity with

mathematics. As Hutchison suggests, the situation has improved somewhat in these respects in more recent times.

Partly also there is a formidable barrier in the tendency of established systems of thought to persist, asserting themselves through such very practical media as dominant schools led by strong personalities in control of academic opportunities. We have heard of self-perpetuating groups in politics and business; this phenomenon is not absent from universities. Schumpeter says that French chairs were long barred to the followers of Walras and German ones to those of Menger. Historicism exerted similar dominance in Germany. Mr. Hutchison refers to the eminence of Marshall's leadership in precluding much inflow of Continental teachings into England after the early nineties. By contrast, a vigorous brand of utility analysis, mainly mathematical, was easily transplanted and readily took hold in Italy, fostered by strong intellects such as Barone and Pantaleoni and relatively unopposed by established academic interests, because there were none. Rather ironically, Italy in recent times has lagged rather markedly in the domain of applied economics, primarily because its valuable tradition of pure theory has long dominated academic research and instruction.

To take still another example, consider the relatively slow penetration of English economics by marginal analysis, despite Jevons' pioneer work. Jevons himself felt in 1879 that the only hope was "to fling aside, once and for ever, the mazy and preposterous assumptions of the Ricardian School. Our English economists," he complained, "have been living in a fool's paradise." Yet it remained for Marshall to carry through this intellectual reformation. He did so in typical English style, preserving what he thought was usable from the past, keeping the form while changing much of the content. Thus the classical real cost doctrine of factor supply survived within the newer context of marginalism, in Marshall's system.

Turning now from history to economics proper, I wish first to suggest a few points raised by Mr. Hutchison's paper. I would agree with him that so far as English economics is concerned, the story after 1870 centers on the slow triumph of marginal analysis, first in value theory and later in factor service pricing and distribution. The conquest of Richardianism by the marginalists involved the ultimate seizure of intellectual territory long isolated from Continental contacts and fresh ideas. Credit for the victory goes to Jevons, Marshall, and Wicksteed. Partly the triumph was a revolution from within, wrought by Jevons' own originality of thought. Partly also the victory was gained by the infusion of new ideas from abroad—ideas that Marshall and Wicksteed absorbed and reworked in their respective fashions.

However, I think there was also another influence at work, indigenous to the British Isles. I refer to the theory of wages, which by the end of the sixties represented a genuine crisis in thought. As a result of the onslaughts of Longe and Thornton, the wages-fund theory was now in disrepute, though the odium was somewhat undeserved. The subsistence theory had patently failed to fit the facts of falling urban birth rates and rising real wages. Tradeunionism was growing stronger, winning intellectual support for its claims

to be able to raise general living standards and to redistribute income. To these claims the older theories had no obvious answer.

The reason was that the older doctrines lacked the tools of partial equilibrium analysis; hence an adequate conception of a derived demand function for labor. Though in its crude way, as Schumpeter says, the wages-fund theory was correct in pointing to over-all, short-run limits to raising living standards by simple redistribution of the social product, its reasoning carried no conviction for those partial cases in which union wage raising actually went on and still largely goes on.

The renovation of wage theory began with the work of Fleeming Jenkin, an engineer by profession. In 1870, Jenkin introduced the idea of a negatively sloped demand function for labor services—a concept redolent with skeptical implications regarding the ameliorative claims of unionism. The theoretical possibilities were not lost by Marshall, who went on to work out the principle of elasticity of derived demand. However, Jenkin himself suggested a kind of indeterminacy for the wage bargain, an idea that was taken up and developed in the eighties by Jevons and Edgeworth. Edgeworth in particular was thus led to his famous theory of bilateral exchange. By the middle of the nineties, the principle of marginal productivity had been worked out, in various formulations, by Wicksteed, Wicksell, and Barone. Clearly this history is complex. Yet it seems a safe inference that the crisis of wage theory in England in the sixties had much to do with the revolution in distributive theory that occurred in that country in the three decades that followed.

Turning to a radically different kind of theory—that of the German Historical School—Professor Dorfman has given us a most interesting account of its influence upon American thinking. As he shows, that influence had its constructive side. It was responsible for the introduction of statistics into academic training, and it fostered interest in the accumulation of quantitative data. So were laid the foundations for modern theoretical and applied work of the highest importance. Moreover, the Germans did much to develop the art of public administration. They were, of course, keenly interested in state intervention and control, where again they influenced American thought. There are legitimate differences of view as to how beneficial *in toto* these doctrines of state intervention have actually turned out to be. But there is no doubt that they did help indirectly to temper the harsh and extreme conception of individualism that was hitherto prevalent in American life and thought.

Yet, so far as the German influence is concerned, there is another side to the coin. Inspired by the Hegelian tradition, the earlier Germans such as Roscher, Knies, and Hildebrand attacked the generalizing qualities of pure theory and sought to substitute in its stead various philosophies of history, apparently wholly unaware that the philosophy of history is another type of generalization from natural law premises. The result was intellectual confusion and little else. But the reaction in Germany was not even a return to classical theory, save for the Marxian sect; far less was it a reformulation of classical ideas along more modern lines. Rather, there emerged the pragmatic relativism and antitheoretical bias that typified the methodological futilities of Schmoller and his circle.

Certainly there was nothing either wrong or even unique in that group's emphasis upon the collection of facts. But to paraphrase Marshall, facts themselves teach nothing. They must be related to theory. It was here that the German school failed. It had seen the possibilities of state intervention. Through its quasi-official standing it greatly developed the arts of public finance and administration. Yet its methodological narrowness seems to have prevented it from ever regarding state undertakings other than as problems of organization. The school showed no awareness of the elementary distinction between economy and waste, whatever the purposes of state action. Having rejected traditional theory as obsolete natural law doctrine, with allegedly hedonistic foundations and implications for policy that supposedly were uniquely laisser faire, the group could offer no rational economic criteria for guiding the choice between the things government could efficiently do and those it could not. In its view the state was omnicompetent. Perhaps there is, then, some connection between this kind of teaching and the popularity of crude ideas of physical planning in more recent times.

One last point: I wish that Professor Dorfman had decided to include Thorstein Veblen in his discussion, for I would have been interested in his assessment of Veblen's relation to German historicism. Concededly, Veblen was not a direct product of German teaching. Moreover, as Mr. A. W. Coats points out in the December, 1954, issue of the *Journal of Political Economy*, Veblen severely criticized the Germans for their preoccupation with facts and historical narratives; hence their lack of "a theory of anything" or of "a consistent body of knowledge." Yet I think Veblen shared much in common with the Germans, in the character of his destructive attack upon pure theory, old and new, and in the relativism of his theory of knowledge. That he was the most influential American exponent of these views seems to me beyond doubt. If so, he could be considered part of the German tradition as it developed in American economics.

Regarding the history of economic thought, an encouraging renaissance is under way. These two papers are valuable contributions to its advancement.

William Jaffé: The character of an economy, to which Professor Bladen has alluded, depends in a certain measure upon the character of economists. Not that economists can make any serious claim to shaping the economy in any significant degree, but simply because what is regarded as the character of an economy consists of attributes selected and delineated by economists. Hence our general conception of any economy is bound to be influenced by the character of the economists describing or analyzing it. When economists are swayed by chauvinistic and nationalistic passions, the progress of our science is inevitably affected.

This makes it all the more interesting to reflect upon the personal attitudes revealed in the private correspondence of the economists of the period covered by Professor Hutchison's paper. From the Walras correspondence preserved mainly at Lausanne and Lyons we learn much about the character not only of Léon Walras but also of his most distinguished contemporaries. Their per-

sonal passions and prejudices had much to do with the sluggishness with which economic ideas moved across international and linguistic frontiers.

Did anyone, for example, discourage Edgeworth from presenting Walras' theories before the English public? The evidence is none too clear. Walras wrote to Foxwell on March 13, 1889, saying that he hoped that his theorem of maximum utility of new capital goods, as it then appeared in the corrected proofs of the second edition of the *Eléments*, would be found worthy of being offered to competent English readers. Foxwell informed Walras on March 15 that he had sent these proofs to Edgeworth and that Edgeworth was editing and translating the theorem for insertion in the next number of the *Journal of the Royal Statistical Society*. Edgeworth, however, soon abandoned the project, for as he explained it to Walras in a letter dated March 19, he had encountered technical difficulties in understanding the theorem (see my article in the *Journal of Political Economy*, April, 1935, page 203, and my Translator's Note [3] of Lesson 27 of Walras' *Elements of Pure Economics*). He added, and this is the significant point for our present purpose: "***with whom I have spoken and myself wish you to feel that we have spared no pains in this matter. I have, in addition to the regret which he feels at not being able to put the paper before the British, the feeling of remorse. . . ." Where I have put ***, the original letter shows a piece of illegible overwriting, the only example of this sort of illegibility I can find in Edgeworth's letters to Walras. It looks a little like "Prof.," and it was translated in Aline Walras' copies as "Le professeur." The "professor" might have been Foxwell, who was then a member, along with Edgeworth, of the Council of the Royal Statistical Society; but perhaps it was Marshall. Such a guess is probably not farfetched, particularly in the light of a later event in which Enrico Barone was involved and to which Professor Hutchison calls attention in his paper.

If the English did not display any great alacrity in admitting the contributions of Continental economists to their journals, it must be conceded that these discriminatory sentiments were reciprocated on the other side of the Channel. In fact, such sentiments were quite general in Europe. Did not Walras write to Barone in November, 1895: "One does not get anywhere with the English unless one puts them in their place and refuses to be pushed around by them. . . . I know from experience that having the English against us brings to our side the Americans who are generally well disposed in our favor." Pantaleoni, writing on August 12, 1889, asked Walras confidentially whether he did not agree that Menger was a plagiarist and Böhm-Bawerk a charlatan! Walras replied cautiously on August 17: "I do not think that Menger was altogether fair to Gossen. . . . As for Böhm-Bawerk, it seems to me that in the preface of his last work, he stated explicitly enough that he had borrowed his theory of capital from Jevons [sic! See Preface to *The Positive Theory of Capital*, page xxiii]; but since this theory isn't worth much, I am quite willing to let that pass."

The Iron and Bamboo Curtains of today were preceded three-quarters of a century ago by nationalistic, linguistic, and other curtains—all impeding the

free flow of ideas in the learned world. What, I wonder, would have been the fate of economic theory in this country had Enrico Barone succeeded in his attempt to obtain a chair here? On November 26, 1895, he wrote to Walras and pleaded with him to use his influence with J. B. Clark on his behalf. Had either Columbia or Harvard found a place for Barone at that time, his theoretical work, which, according to Schumpeter, was never properly appreciated in Italy, might have found new scope; and economic theory in America might earlier have been enriched from abroad, as it has been more recently by the teaching of economists who have come to us from many lands.

DEVELOPMENT POLICY IN UNDERDEVELOPED COUNTRIES

THE ROLE OF INDUSTRIALIZATION IN DEVELOPMENT PROGRAMS[1]

By HOLLIS B. CHENERY
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Industrialization is the main hope of most poor countries trying to increase their levels of income. It is also the most controversial aspect of the problem of economic development. Attempts to apply general economic principles to this field have usually proven inconclusive. This result has been due to an incomplete theoretical formulation of the problem as well as to inadequate data. In most cases there remains a wide margin of disagreement between the advocates of international specialization and investment in primary production on the one hand and the proponents of "balanced growth" and industrialization on the other.

Most of the participants in this controversy would probably accept the proposition that the primary aim of a developing country is to secure the greatest increase in its income (total or per capita) from its available resources in the long run. The main problem lies in evaluating the amount of scarce resources which will actually be required by alternative types of production. For a number of reasons, the price system, which makes this evaluation fairly accurate in more highly developed economies, is often a rather unreliable guide to the desirability of investment in an underdeveloped economy. Even when corrections have been made for the more obvious defects in prices, such as tariffs and subsidies, there remain two sets of factors which make a partial equilibrium analysis based on existing prices very difficult: (1) the existence of structural disequilibrium in the use of factors of production, with labor commonly underemployed and capital and foreign exchange rationed; and (2) the interconnectedness of productive sectors, as a result of which investment in one may make investment in others more profitable—often called "external economies."[2]

[1] This paper is based on a study of Resource Allocation in Development Programs which has been made possible by a grant from the Stanford Committee for Research in the Social Sciences.

[2] The distinction between these "pecuniary" external economies and the more traditional "technological" external economies has been pointed out by Scitovsky in "Two Concepts of External Economies," *Jour. Pol. Econ.*, April, 1954 Rosenstein-Rodan was among the first to analyze this factor in "Problems of Industrialization of Eastern and South-Eastern Europe," *Econ. Jour.*, 1943, pp. 202-211.

Both of these factors are particularly important in evaluating industrial investments. Less than half of the total use of primary factors takes place directly in the average sector producing an industrial commodity; the remainder is scattered throughout the economy in the sectors producing raw materials, producer services, and other industrial commodities. In contrast, most of the requirements of capital, labor, raw materials, and foreign exchange for agricultural and mineral production and services occur directly in the producing sector. It is therefore possible to take account of the existence of structural disequilibrium fairly well in evaluating nonindustrial investments, but both the existing disequilibrium and the effects of future investment complicate judgments on industrial investment.

The present paper will investigate the influence of these two factors —structural disequilibrium and external economies—on the optimum amount and composition of industrial investment in a development program. Such an analysis can only be made in the context of a general equilibrium model because intersectoral relations are the essence of the problem. The empirical background for the model is taken from an over-all study of the Italian economy[3] and of the development programs for Southern Italy.[4]

The paper consists of three parts. The first summarizes the essential features of the model and the method of application. The second part shows the effect on industrial investment of variation in three key factors reflecting the factor endowments of a given area: the labor supply, the availability of foreign exchange, and the rate of growth. The third part shows the difference between an optimum program which takes into account external economies and one which does not. It also tries to shed some light on the general problem of investment priorities.

I. *A Model of Economic Development*

General Characteristics. In order to throw light on the problems I have just outlined, the analytical model must include the following elements: (1) the use of capital, labor, and purchased materials and services in each type of production; (2) the foreign exchange cost of possible imports; (3) the foreign demand for possible exports; (4) restrictions on the commodity composition of any increase in national income; (5) availability of labor, foreign exchange, investment funds, and other scarce resources.

[3] Preliminary results have been published in H. B Chenery, P. G. Clark, and V. Cao Pinna, *The Structure and Growth of the Italian Economy* (Rome: U. S. Mutual Security Agency, 1953).

[4] Empirical data for the analysis of development programs within the framework of a regional input-output model is being collected by the Input-Output Unit of the Italian government and the Association for the Industrialization of Southern Italy, to which the author is a consultant.

The statistical basis for such an analysis is provided by an input-output table, augmented by studies of consumer demand, export demand, etc. The solution to the problem involves choice between domestic production and imports, between production for the home market and exports, and maximization of output within the given restraints. The analytical technique, therefore, must be the more general one of linear programing, which in this case is a straightforward extension of input-output methods.

The purpose of the investment program is to secure a specified increase in national income with a minimum use of investment funds, subject to limitations on the composition of national income, export demand, labor supply, and foreign exchange availability. In the case of Southern Italy, investment funds are variable through subsidies from the central government, and total investment is therefore variable within limits. In other cases, the maximum growth achievable from a given rate of saving could be estimated by varying the time period of the analysis.

The several restrictions in the model are incorporated in the solution in various ways:

1. The division of national income between consumption and investment is taken as fixed. Consumption is assumed to be a function of per capita income only, as described below. All elements in final demand are therefore determined by the assumed increase in national income.

2. Total investment must equal savings plus the excess of imports over exports, summed over the time period involved (ten years). We are not concerned with the time path of production during the period, however, but only with the flow of goods and services at its end. If necessary, the amount of investment included in final demand may be modified in a successive approximation.

3. The excess of imports over exports must correspond to the required amount of external investment funds determined by the solution. Solutions must be determined for several possible levels of the trade deficit to meet this condition.

4. The price of labor must be such that total demand does not exceed the total supply.

The size of the model used represents a compromise between the need for sufficient detail to illustrate the interdependence actually existing among productive sectors and the necessity to hold down costs of computation. Since the interconnections among the industrial sectors are the most significant, the test model contains nine industrial sectors, two sectors of primary production, and three service sectors. Five export sectors have been distinguished, while imports are possible in ten of the fourteen sectors. This model represents a considerable aggrega-

tion of the original Italian input-output study, which contained sixty sectors, and of the matrix for Southern Italy, which contained twenty-eight sectors.

Elements in the Model. The following paragraphs will indicate the conceptual nature of the various elements in the model. For present purposes, it is sufficient to consider the numerical data as fairly realistic estimates of the parameters involved. The input coefficients and consumption estimates result from extensive statistical investigations, while most of the other relations are based on scantier evidence or (where indicated) on pure hypothesis.

1. *Total Requirements.* As the model is formulated, a specific set of final consumption levels for the several commodity groups is taken as the goal of the investment program. These requirements can in most cases be satisfied from either production or imports. The GNP in the target year will equal the total of these final demands less the import surplus. To simplify the analysis, I assume that capacity in the base year is fully utilized and that in no case will it be efficient to shut down existing production. Present production (net of interindustry use) can then be subtracted from the given final demands to determine the total requirements by sector to be supplied from either increased production (requiring new investment) or imports. These two sets of estimates are shown in Table 3 on page 47.

Final demand consists of government consumption, private consumption, investment, and exports. (The estimates of final demand were made in Italy by the collaborating groups noted above. They were taken as data for the present test, with the exception of some exports, which were allowed to vary as explained below.) The magnitude of investment was based on the estimated sum of domestic savings and the import surplus (as indicated above) while government consumption was projected from past trends; the composition of both was kept unchanged. A more detailed study was made of private consumption. Consumption estimates for some seventy commodity groups were based on population growth and income elasticities related to prospective increases in per capita incomes. They were then aggregated to the present number of sectors.

2. *Production Possibilities.* Each of the commodity groups in the model represents an aggregation of many subgroups. For this test, I have secured average input coefficients through aggregating the intersectoral flows into fourteen groups. I have retained the variation in capital/output ratios within each sector, however, by arranging the subsectors in the order of their capital intensity and assuming that their output will be required in fixed proportions. On this assumption, it will be economical to produce those commodities within each sector

which have low direct capital requirements and import those having higher capital requirements, since the indirect capital use within each major sector is assumed to be the same for all subsectors. (If this assumption is not made, the number of sectors must be increased.)

For the linear programing model, the alternative ways of satisfying the given requirements in sectors where imports are possible consist of mixtures of domestic production and imports. The input requirements for domestic production are given in Table 1, and the capital and labor requirements in Table 2A. Some allowance must be made in using minimum investment as a test of efficiency for the fact that capital goods have different degrees of durability. This was done here in the case of land reclamation and other agricultural construction through reducing the capital requirement by the estimated present value of the capital stock twenty-five years hence. An alternative would be to treat capital consumption as a separate input. The assumed variation in capital coefficients within each sector is largely hypothetical, as are the labor coefficients. The capital coefficients in industry were based on a sample of some seventy-five investment projects which were actually undertaken in the past few years. Imports are assumed to require one unit of foreign exchange in each sector except agriculture (assumed to require 1.25).

The choice between domestic production and imports is made by comparing the marginal direct and indirect use of capital in domestic production with the domestic price of imports. This procedure results in a decrease in the proportion of requirements in each sector which is imported as the price of foreign exchange rises.

3. *Exports.* The assumed demand functions for exports are given in Table 2B. The optimum level of exports in each sector will be that at which the marginal (direct and indirect) cost of producing exports is equal to the domestic value of the marginal revenue from increased exports. This optimum level will increase for higher prices of foreign exchange.

Solution. The techniques of solving linear programing problems need not concern us here, but the concepts are useful. In the present case it was possible to take advantage of the fact that the matrix of input coefficients can be made almost triangular—i.e., the interdependence is almost all in one direction, as shown in Table 1. This characteristic makes it possible to solve the problem without inverting the matrix of coefficients, which saves on solution time and also makes it easy to handle the demand functions for exports which have been assumed. The concept of "shadow price" plays a key role in the solution. It measures the total use of scarce resources in the economy to produce a given commodity. In the present case shadow prices are expressed in

TABLE 1

INPUT COEFFICIENTS*

Sector	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV
I. Clothing	+.917	—		001	001	—	—	—	—	—	—	—	—	—
II. Textiles	254	+.615	001	003	016		—	.001	—	—	.008	—	.001	—
III. Construction	—	—	+.819	.013	.011	—	010	—	—	—	.004	—	.001	—
IV. Mechanical	003	—	.063	+.897	012	—	.001	—	—	—	001	—	—	—
V. Other industries	005	001	033	.037	+.857	.001	.003	—	037	—	008	—	.001	—
VI. Food	027	001	—	—	001	+.873	001	.021	—	.006	023	.001	002	—
VII. Metallurgy	001	—	081	221	018	004	+.515	—	—	—	011	—	—	—
VIII. Agriculture	003	.138	002	—	149	430	.002	+.899	011	—	023	005	.001	.001
IX. Transport	001	005	.011	011	049	021	.017	022	+.966	032	012	.151	—	—
X. Petroleum	002	008	027	017	010	005	.019	004	.253	+.957	015	011	.013	.018
XI. Chemicals	.018	059	012	.017	089	.006	.050	023	002	013	+.691	032	—	.001
XII. Mining	001	005	.058	003	002	004	055	001	048	211	071	+.995	—	035
XIII. Services	357	168	043	141	193	192	.007	169	027	034	132	067	+.957	.010
XIV. Power	001	007	005	009	.004	003	049	.002	038	—	035	.013	005	+.994

* Per unit of output (in value terms).

TABLE 2A

CAPITAL AND LABOR COEFFICIENTS

Sector	Labor/Output Coefficient*	Average Capital/Output† Coefficient
I. *E* Clothing Export	1.00	.5
I. Clothing	1.00	.2+.1*d*
II. E Textile Export	.50	.65
II. Textile	50	.5+.275*d*
III. Construction	1.80	.45
IV *E* Mechanical Export	65	.87
IV Mechanical	.65	.5+.75*d*
V Other Industry	.90	.2+.9*d*
VI *E* Food Export	.15	.58
VI Food	15	.33+ 25*d*
VII. Metallurgy	50	.6+ 9*d*
VIII Agriculture	0	2 0+ 833*d*
IX Transportation	50	3 86
X Petroleum	.15	.72
XI. *E* Chemical Export	.35	.75
XI. Chemical	.35	.38+*d*
XII. Mining	.45	−6 796+10*d*+1 578/*d*
XIII Services	3 00	58
XIV Power	.20	3 0

* In 1,000 employees per billion lira of output.
† Where *d* is the ratio of domestic production to total requirements in each sector

terms of investment cost. The shadow prices of other basic factors whose supply is limited—foreign exchange and labor—are measured by their opportunity costs. Given the prices of these resources, the shadow price of each commodity consists of its direct capital cost plus the sum of all its inputs multiplied by their shadow prices. The optimum solution is reached by comparing cost of securing each commodity by alternative methods with the value given by its shadow price. This method is well suited to handle alternative production techniques when such data are known.

The usual method of solving a linear programing problem involves fixing the resource availabilities and output requirements and determining the optimum combination of activities which corresponds to these

TABLE 2B

ASSUMED DEMAND FOR EXPORTS

Sector	Export Level*
I. *E* Clothing	200 (1 − *P*)
II. *E* Textiles	300 (1 − *P*)
IV. *E* Mechanical	600 (1 − *P*)
VI. *E* Food	2000 (1 1 − *P*)
XI. *E* Chemical	200 (1 − *P*)

* Where *P* is the price in foreign currency All functions are purely hypothetical.

limitations. In the present case it has proved useful to examine the implications of varying levels of availability of foreign exchange and labor. I have therefore assumed several combinations of the prices of labor and foreign exchange and determined the use of these resources corresponding to the assumed prices. The results can be plotted in a graph, as in Figure 2 on page 51, from which it is possible to determine the optimum prices corresponding to any levels of foreign exchange and labor. These prices in turn determine the activities used and investment in each sector.

TABLE 3

TOTAL REQUIREMENTS BY SECTOR

Sector	Final Demand*	Total Requirements†
I. Clothing	278	162
II. Textiles	195	191
III. Construction	447	280
IV. Mechanical	427	383
V. Other industries	163	144
VI. Food ...	1,308	443
VII. Metallurgy	36	31
VIII. Agriculture	639	98
IX. Transport	70	24
X Petroleum	225	168
XI Chemicals	132	149
XII. Mining	63	68
XIII. Services	148	40
XIV. Power ...	59	22
Total	4,190	2,203

* Including 416 billion of exports for which the demand is taken as given.

† Final demand less domestic production in excess of interindustry demand in the base year; i.e., the excess of projected total demand over net domestic availabilities in the base year Total requirements are equal to the increase in GNP plus the excess of imports over exports.

For each set of parameters, we have made several trials with varying prices of foreign exchange, holding the other parameters constant.[5] The results of these trials are shown in Table 4. Each one represents the solution requiring the minimum investment under the stated assumptions as to the values of the parameters. In the first three trials, an interpolation has been made at a constant deficit of 284, which was estimated to be the average amount of external resources necessary to achieve the desired increase in GNP within a ten-year period.

II. *Key Factors in Industrial Development*

I will now investigate the effects of differences in resource endowments, factor proportions, savings levels, and other basic factors on

[5] All the calculations on the aggregated model were made by Kenneth Kretschmer.

TABLE 4

RESULTS OF TRIAL SOLUTIONS

	A1	A2	A3	A4	A5	B1	B2	B3	C1	C2	C3	D1	D2	D3	E
Price of foreign exchange.....	2.7	2.8	2.9	3.0	2.84*	3.0	3.3	3.5	3.5	3.8	3.719*	2.7	3.0		3.60
Price of labor	0	0	0	0	0	.3	.3	.3	.6	.6	.6	0	0		0
Requirements‡	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	.5	.5		1.0
Exports...	686	714	739	766	725	597	680	737	582	666	643	686	766		651
Imports.	1163	1062	944	832	1009	1278	964	739	1208	823	927	861	629		926
Trade deficit	477	348	205	66	284	681	284	2	626	158	284	175	−137		276
Increase in GNP .	1391	1524	1672	1812	1590	1150	1553	1834	1187	1652	1527	953	1051		1598
Investment in															
Industry..	1436	1600	1789	1959	1685	1063	1494	1824	1023	1468	1348	1033	1448		1629
Agriculture.	389	519	676	838	589	376	840	1231	625	1289	1110	293	637		789
Services.	669	717	772	818	742	579	720	818	592	746	704	436	555		740
Total....	2494	2836	3238	3615	3016	2019	3054	3874	2240	3503	3162	1736	2640		3158
Total labor†.	2839	3042	3270	3473	3145	2346	2929	3347	2298	2923	2755	1914	2423		3001
Ratio of investment to increase in GNP	1.793	1.861	1.937	1.994	1.895	1.755	1.966	2.112	1.887	2.120	2.057	1.850	2.513		1.976

* Interpolated.
† Excluding labor in agriculture.
‡ Fraction of requirements vector given in Table 3

the optimum patterns of economic development. The hypothesis underlying this study is that industrialization may play a very diverse role in different types of country. Where structural disequilibrium exists, it is almost impossible to determine from the price system the true weight which should be given to these factors in investment decisions.

Variation in the underlying structural factors is reflected in a formal model through differing values of some of the parameters. Here I will

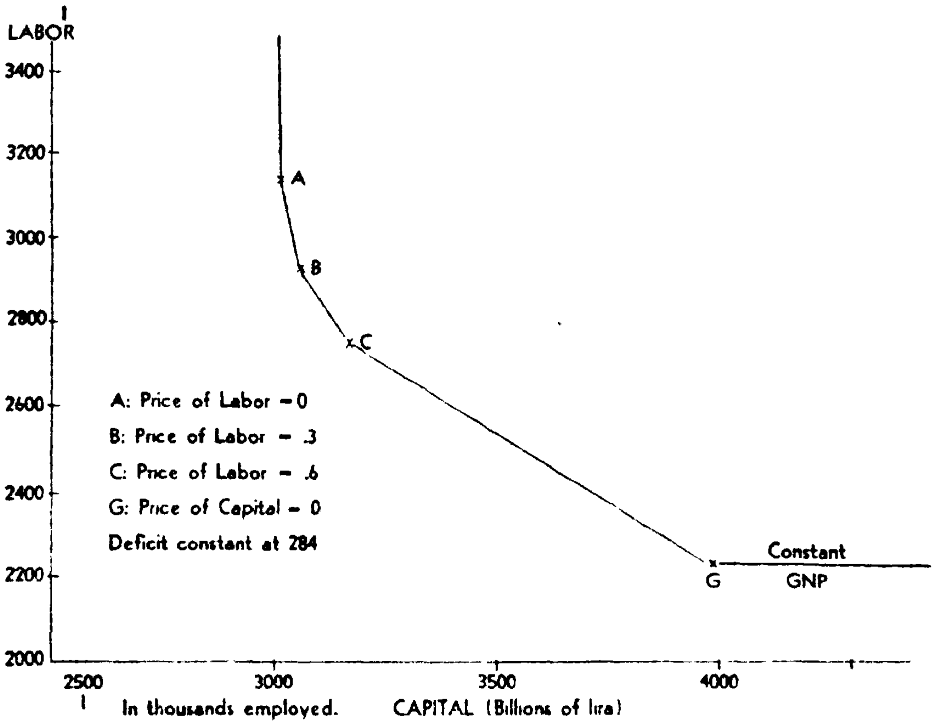


FIGURE 1 SUBSTITUTION BETWEEN CAPITAL AND LABOR

analyze effects of variation in the parameters related to three basic characteristics of developing economies: (1) factor proportions; (2) availability of foreign exchange; (3) the rate of growth.

Factor Proportions. The optimum pattern of economic development obviously varies widely with the endowment of available economic resources. Individual mineral resources, specific types of agricultural land, etc., are reflected in the capital requirements of individual sectors and determine the desirability of specific types of primary production. They require little comment. The relative abundance of larger categories of economic factors—aggregate natural resources, labor, and investment funds—is subject to more general analysis. The most sig-

nificant relationship is that between population or labor force as a whole and natural resources plus capital stock. It is often suggested that in the "overpopulated" areas, where pressure on the developed resources—primarily agricultural—is high, industrialization is more desirable than in countries where a shift of the labor force from agriculture to industry (without investment or technological improvement) would cause a significant fall in agricultural output.

Population pressure may affect several parameters in the model. In the first place, it means that there will be a fairly unlimited supply of labor available for nonagricultural employment. This labor is not a free good because—at least in part—it must be moved to towns, housed, and trained. In our system, this means that labor will have a shadow price or capital cost greater than zero but in all probability considerably less than the actual wage rate. In other cases, the opportunity cost of labor may equal or exceed its wage.

The over-all possibility of substituting labor for capital with fixed input coefficients is shown in Figure 1. Point *C* corresponds roughly to existing wage rates in Southern Italy, while point *A* represents the optimum solution with labor as a free good. The variation in total capital requirements corresponding to this change in the use of labor is not large—about 5 per cent—because the composition of imports and exports is the only factor which has been allowed to vary; techniques of production and the composition of final demand have been kept constant.

This variation in the optimum investment pattern takes place largely in the industrial sector. When the price of nonagricultural labor is taken at approximately the existing wage rate (no opportunity cost is assigned to agricultural labor, on the theory that even the most successful investment program will leave it in surplus supply), the fraction of total investment going into industry in the optimum program is 43 per cent. ("Industry" includes mining and manufacturing and excludes power and other services. See Table 4 above.) When both types of labor are "free," the optimum share of industry is increased to 55 per cent. (These proportions refer to "productive" investment, which is perhaps 70 per cent of the total investment taking place.)

Population pressure is also likely to be reflected in the relative levels of the marginal capital coefficients in agriculture and industry. In an overpopulated area, land is utilized more intensively in agriculture, and the capital required to extend the land under cultivation through reclamation, irrigation, etc., is greater. Densely populated areas are also likely to have fragmented land holdings which make mechanization less productive. To take two rather extreme examples, the marginal capital requirements per unit of output in agriculture in Southern Italy

are perhaps three times as high as they are in Turkey. There is little difference in the capital requirement in industry, however.

A variation in the capital/output ratio in agriculture will be reflected in changes in the desirable levels of investment in all the industrial sectors if a given increase in GNP is to be achieved. In the present instance, a lowering of the agricultural capital coefficient by about 15 per cent produced a decrease in the share of investment going to industry of about 20 per cent. Only the food processing industries increased their output. These particular values of course depend on the variability of capital coefficients within agriculture and industry.

Both of these aspects of the factor proportions problem thus appear to be quite significant in determining the role to be given to industrial investment. The importance of the "employment ratio" may be overstressed in actual practice, however, when it is divorced from the over-all test of increasing national income.

Availability of Foreign Exchange. The ability of a country to secure foreign exchange is another key factor in determining the desirable extent of industrial development. Industrialization consists pri-

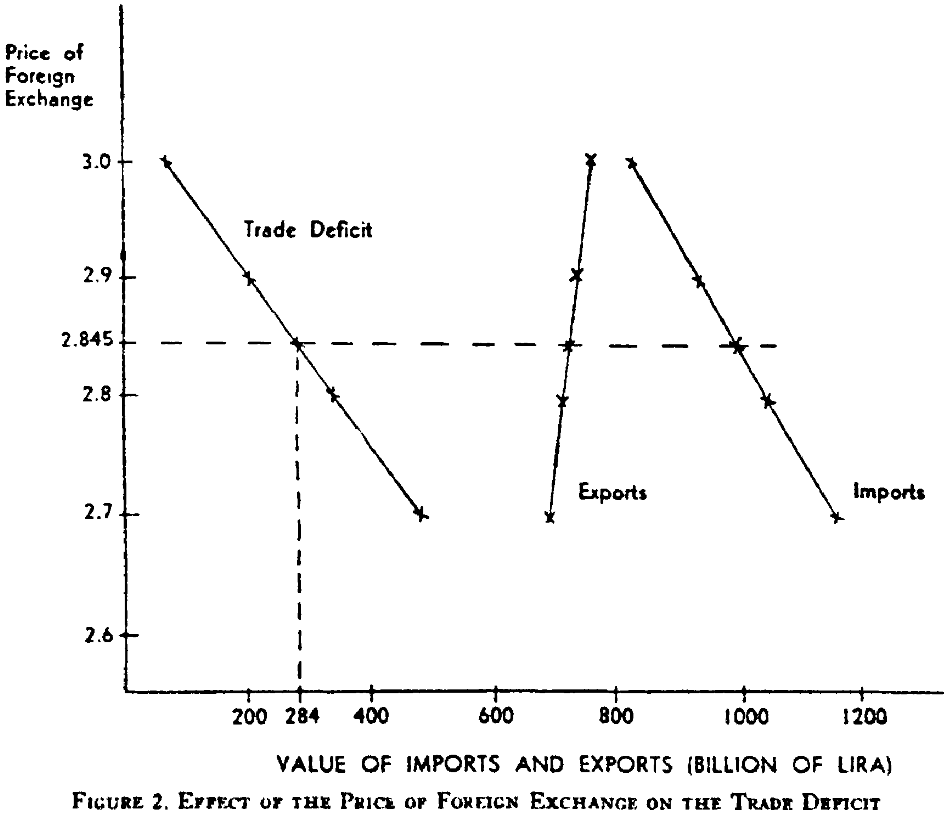


FIGURE 2. EFFECT OF THE PRICE OF FOREIGN EXCHANGE ON THE TRADE DEFICIT

marily in the substitution of domestic production of manufactured goods for imports. The choice between domestic production and imports should be based on the scarce resources required by each alternative. In a linear programing model, this decision is based on the shadow price of foreign exchange, which is determined by the opportunity cost of domestic production in the marginal importing and exporting sectors. In equilibrium, the price of foreign exchange becomes the reciprocal of the marginal productivity of investment in these sectors.

The effect of changes in the price of foreign exchange on imports and exports is shown in Figure 2. The import curve represents the total demand of the economy for imports, taking account of optimum readjustments in domestic production at each price of foreign exchange.

The effect on the investment decision in any sector of a rise in the price of foreign exchange will be determined by three factors: (1) the rise in the price of imports of the commodity produced; (2) the variation in direct capital and labor costs in the sector; (3) the rise in the cost of materials purchased from other sectors. Investment in other sectors will cause the price of purchased materials to rise less than the price of imports. These external economies will affect primarily the finished goods sectors, where investment will be more attractive. As will be noted below, errors of partial analysis are largest in those sectors.

The export curve represents the combined effects of variations in supply and demand at each price of foreign exchange. Although constant capital coefficients were assumed, the rise in price of materials purchased by the export sectors serves to reduce the elasticity of supply, particularly for finished goods.

The optimum or equilibrium price of foreign exchange is determined by the ability of the area to sustain an excess of imports over exports through external borrowing or subsidies. In the present example, substantial subsidies are necessary to achieve the desired increase in national income, and the annual trade deficit is almost 7 per cent of GNP. One effect of such outside assistance is to permit the region to specialize to a greater extent in the less capital-intensive activities and secure a given increase in regional income with a somewhat smaller use of capital. Since many branches of industry are less capital intensive than agriculture in the present model, a higher deficit results in a greater proportion of investment going to industry. In other countries, the opposite result might well occur, however.

Since the equilibrium price of foreign exchange determines the limits to which investment should be carried in each sector where exports and imports are possible, it is the most crucial parameter in formulating a development program. If too low a value is used, for example, the

trade deficit will be larger than can be financed and emergency measures to stimulate exports or reduce imports will have to be taken. These will lead to investment at lower rates of productivity than would be the case if the proper exchange rate had been used throughout the program. The resulting increase in total cost of the program is illustrated in Section III below.

The Rate of Growth. The rate of growth affects the pattern of investment in two different ways. In the first place, foreign exchange earnings are fairly independent of the rate of growth. Except for improvements in technology or possible economies of scale in export production arising from a larger domestic market, foreign exchange earnings depend on the exchange rate and the elasticity of foreign demand for such exports. Imports, however, will increase with the rate of growth unless the exchange rate is changed, as shown in Figure 3. Even if foreign borrowing depends to some extent on the growth in national income, there will be a tendency for the net deficit to be greater at higher rates of growth.

In order to limit the trade deficit of foreign exchange availabilities a higher price must be given to foreign exchange. In the present example, an increase in the rate of growth by 10 per cent would have increased the exchange rate needed to maintain a constant deficit by 2 per cent. The marginal productivity of investment would fall by the same amount. Although this effect is not significant for small variations,

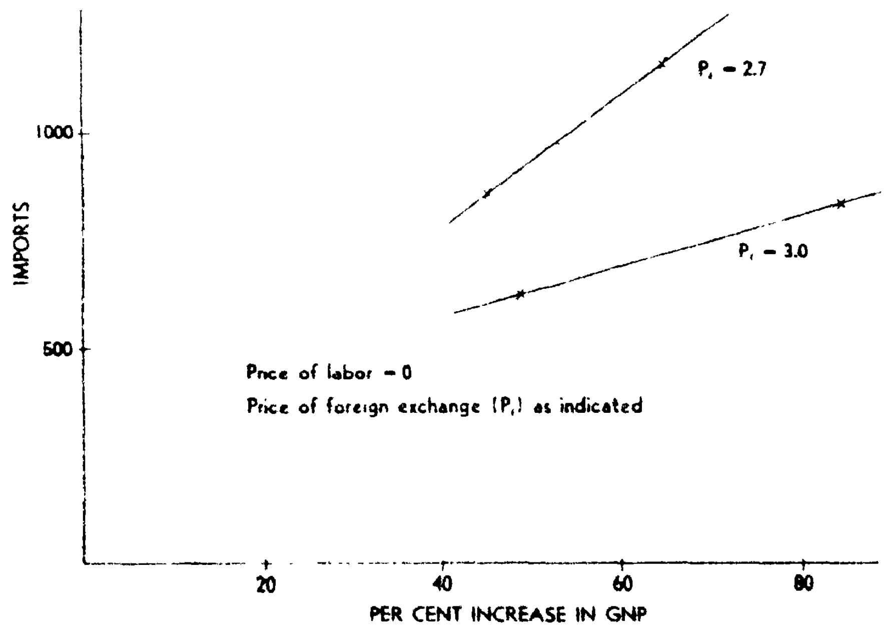


FIGURE 3. EFFECT OF GROWTH ON IMPORT REQUIREMENTS

when the growth rate is greatly accelerated it may become quite important. Higher growth rates lead to a greater need for self-sufficiency unless export demand is highly elastic.

The rate of growth will also act on the composition of investment through its effects on final demand. As per capita incomes increase, the proportion of income spent on manufactured consumer goods of all kinds may be expected to increase. The study of consumption in Southern Italy on which the final demand in the present model is based showed an income elasticity of demand of 1.35 for all manufactured goods (except food). The proportion of national income spent on investment goods is also likely to increase. Both of these factors will lead to an increasing proportion of investment in industry.

Both the increased demand for imports and the shift in the composition of final demand to more manufactured goods tend to give an increased importance to industrial investment at higher rates of growth. The increased pressure on foreign exchange may affect the desirability of investment in agriculture as much as in industry in some countries, but there are more likely to be technological limits to a rapid increase in agricultural output through increased investment. Throughout this discussion I have left out of account technological improvement in agriculture, which may be one of the most important elements in increased output. The rate of technological progress in agriculture is limited by other factors, however. This conclusion appears to have particular force in an overpopulated area like Southern Italy, where a further increase in the rate of growth in the agricultural sector can only be secured at very high capital/output ratios.

III. *Structural Interdepedence and Investment Priorities*

The preceding section has illustrated the way in which the decisions affecting industrialization depend on resource availabilities and investment in requirements in all sectors. The interdependence among sectors introduces errors into any method of making investment decisions based only on the characteristics of single sectors or projects. I shall now try to analyze these errors and suggest methods of improving partial methods from the experience gained in solving a general equilibrium model.

Errors in Partial Analysis. Partial analysis uses the same general test for investment allocation as does linear programing: the marginal productivity of investments included in the program should be greater than those which are excluded. The marginal productivity may not be equal in each sector because of limitations on the commodity composition of output even though a perfect price system would bring about such equality. With either method, an optimum program satisfying

the various resource limitations can only be arrived at by trial and error. There are various routes by which the final solution can be reached, but a convenient method in both cases is to assume a marginal productivity of investment, to exclude projects falling below this figure, and then to see whether investment funds have been exhausted and other limitations satisfied. In the partial analysis it is possible to take account of some errors in the price system, such as the existence of a tariff on imports of the product, but not of the indirect effects of such errors on the price of purchased materials.[6]

As has been pointed out earlier, the partial analysis is subject to two general types of error arising out of interconnectedness: inability to determine how much of a given commodity will be required and the omission of external economies due to investment in other sectors. The first type of error is probably of greater quantitative significance. To measure it would require a comparison of the output forecasts which would be made in ignorance of the input-output pattern with the results of the present model. These errors would be small for finished goods and larger for intermediate products and producer services. Since the latter sectors have higher capital coefficients, the errors in estimating investment requirements would be greater than those in forecasting output. They cannot be measured here for lack of a basis of comparison, however.

The second type of error—omission of external economies—can be isolated by assuming the same knowledge of the interdependence of output in both cases and the use of constant current prices in determining which commodities shall be domestically produced and which imported. The partial method would therefore assume a constant ratio of value-added to total output in each trial. To compare this method to the linear programing model, I have made a solution corresponding approximately to trial A5 in Table 4 in that the increase in GNP is almost the same (see trial E, Table 4). The differences between these two solutions show the magnitude and also the nature of the errors in the partial method.

In terms of the over-all test of capital requirements (labor being assumed free in this trial), the difference of about 115 billion lira (corrected for the difference in GNP) is not large—about 4 per cent of total investment requirements. If we limit the comparison to the marginal cases in which external economies have some significance, however, this difference is much more important.

The best indication of the inefficiency of the partial method is the fact that the marginal productivity of investment (the reciprocal of

[6] A suggested method using partial sector analysis has been given in my "Application of Investment Criteria," *Quart. Jour. Econ.*, February, 1953, pp. 76-96.

the price of foreign exchange) with the partial method is much lower—28 per cent as compared to 35 per cent for linear programing. This difference results from the fact that external economies are not taken into account and underinvestment in some sectors results. In other sectors, investment must be pushed to lower levels of productivity to secure the same increase in GNP. There will be underinvestment in the sectors which purchase a large amount from other sectors, as in the production of finished goods. Textile production in the present case was 40 per cent lower with the partial method than with linear programing. Conversely, there will be overinvestment in primary production and basic industries to compensate for the first error; agriculture is 30 per cent higher with the partial method.

Regardless of the values of the various parameters, there will be this systematic bias in favor of primary production and basic industries and against finished goods when external economies are ignored. These biases also extend to the export sectors.

Planning Industrial Development. To improve on partial analysis, some of the effects of structural interdependence must be taken into account. The methodology which has been used here may be helpful even when all the elements are not known. This method takes advantage of the fact that interdependence in the economy is not general, but is largely "one way." The demand for basic materials depends on the demand for finished goods; the demand for minerals and agricultural products depends on the first two categories; and, finally, the demand for fuels, power, transport, and producer services depends on all of the others. The extent of this one-way interdependence in the Italian economy is shown in Table 1; less than 5 per cent of the interindustry flows occur to the right of the diagonal when the sectors are arranged in such a way as to minimize such circular interdependence. To compute output requirements we should start with the sectors at the top of the list, while to trace out the effects of external economies on prices we should start at the bottom.

A procedure which will introduce some of the elements of a general equilibrium analysis into the usual sector approach is the following:

1. Divide the economy into as many sectors as can be managed and arrange them in the order of maximum one-way interdependence as indicated in Table 1.

2. Within each sector, rank projects according to their marginal return on investment, using expected prices and correcting for tariffs, subsidies, etc., where possible.

3. Estimate the final demands in the economy which would result from the increase in income expected from the investment program.

4. Using an assumed marginal productivity of investment, exclude

projects in each sector which have lower returns, wherever there is the alternative of importing. Include all export projects which exceed this rate of return. Start at the bottom of the list in making this estimate (with services and primary production) and revise the cost of purchased materials where possible on the basis of previous decisions as to imports or domestic production.

5. Starting at the top of the list of sectors, compute the required output in each from the final demand and the estimated use in preceding sectors. Compute imports, exports, and the payments deficit.

6. Revise the size of the program downward if the available investment funds have been exceeded. Revise the productivity of investment downward if the trade deficit is excessive. Repeat the calculation until limits on investment, foreign exchange, and other resources are satisfied.

It would require a paper much longer than the present one to explore the practical problems involved in each of these steps. They will vary greatly depending on the type of information available. One great advantage of using such a framework for investment analysis, however, is that it can incorporate whatever fragmentary information is available from a variety of sources—engineering studies, demand analyses, import statistics, etc. This approach merely makes the judgments which will be made in any case more consistent.

IV. *Conclusion*

The role of industrialization in economic development cannot be evaluated by looking only at individual sectors. This paper has explored the ways in which our judgments may be modified by looking at the total effects of an investment program. To make this investigation, I have had to abandon the *ceteris paribus* assumptions of partial equilibrium analysis and work with a general equilibrium system. Although some of the parameters are estimated from very inadequate evidence, the most important elements—the input coefficients—are the most reliable. Few of the above conclusions would have been changed by large deviations in the other parameters.

Knowledge of structural interdependence is particularly important in the industrial sectors of the economy. The external economies which occur in these sectors provide the justification for investment in "social overhead" facilities and in much of primary production. The desired level of output in each industrial sector depends on developments in the others. We have seen that factor proportions, comparative advantage, and the rate of growth all affect the amount and type of industrial investment which is desirable. My main result, therefore, has been to stress the need for over-all analysis in planning industrial development.

INVESTMENT IN AGRICULTURE IN UNDERDEVELOPED COUNTRIES

By William H. Nicholls[1]
Vanderbilt University

"Ill fares the land, to hastening ills a prey,
Where wealth accumulates, and men decay."
—Goldsmith, *The Deserted Village*

In this paper I shall assume that development policy in underdeveloped countries has, as its minimum objective, an increase in per capita real national income. However, in considering the place of agricultural investment in general economic development policy, I prefer to use a more rigorous standard of economic progress which also takes the distribution of the (larger) national income into account. More specifically, I shall define economic progress as a rise in per capita real income which is in some degree shared by every sector of the economy. This means that I am unwilling to accept as economic progress the alleged gains (essentially a statistical mirage) which may result from subsidizing a parasitic type of development in one sector by means of direct or indirect levies on other sectors, which are made worse off in the process. It also means that, at least in a long-run context, I insist that agriculture and its major subsectors must share in any real gains in per capita national income if we are to consider the claims of successful economic development valid. At the same time, I shall argue that—quite apart from such equity considerations—sustained economic development is impossible if it is sought on the basis of agricultural policies which promote the interests of a few of the larger commercial farmers without concomitant attention to progress within the broad base of essentially subsistence agriculture so characteristic of most underdeveloped countries.

Due to the limitations of space and my own foreign experience, I have decided to confine my treatment of an extremely broad subject to a case study of one prominent underdeveloped country, the Republic of Turkey. I shall review Turkey's remarkable expansion in agricultural output in recent years, shall seek to appraise the extent to which its ambitious agricultural development program has contributed to this expansion, and shall conclude with a discussion of the lessons to be learned from Turkey's recent experience.

[1] I am indebted to G. E. Brandow, Murray Ross, T. W. Schultz, Frank T. Bachmura, Anthony M. Tang, and Roger Weiss for their helpful criticisms of an earlier draft of this paper.

I. *Recent Agricultural Development Policies in Turkey*[8]

When I was in Turkey in 1950 as a member of the International Bank mission, even Turkey's limited industrial output was piling up in inventories because of lack of purchasing power on the part of its dominant peasant population. The 1949 cereal harvest had been extremely poor, resulting in a sharp reduction in national income, and several hundred thousand tons of wheat had to be imported. Partly under the prodding of the ECA mission, accompanied by considerable financial and technical assistance from abroad, the Turkish government had already embarked upon a substantial agricultural development program. This program put major emphasis upon farm mechanization and high cereal price supports. Mechanization was justified on the grounds that it would put Turkish wheat and cotton on a substantial export basis by which the foreign exchange for farm machinery (including spare parts and fuel) might be more than recouped. The two agricultural specialists of the Bank mission, of which I was one, were extremely skeptical of the prospects that mechanization and price supports would prove to be very effective means of expanding agricultural production.

Our skepticism resulted from the fact that the typical Turkish peasant had only ten to fifteen acres of land, which appeared to be far too small to make mechanization economically feasible or high price supports a very effective stimulus to increased output. Even on larger holdings, fragmentation often offered a further deterrent to mechanization. Hence, our Bank mission report emphasized the importance of improving rural transportation, communication, and marketing facilities so that Turkey's several million peasant families might be more fully integrated into a single national market economy. We also strongly recommended expanded and improved agricultural research and extension services, public farm credit, and direct subsidies for the adoption of recommended farming practices, directed at helping the peasant increase his output from his few acres of land.

In making these recommendations, we assumed that, given its prevailing primitive production and marketing techniques and small landholdings, Turkish agriculture had a very low short-run elasticity of supply. Hence, we supported longer run public policies which we believed would lower its whole supply schedule. However, we emphasized

[8] This section draws heavily upon the following source materials: G. E. Brandow, *Agricultural Development in Turkey*, Foreign Operations Administration, Ankara, Dec., 1953, mimeo., pp. 2, 7, 9, 11-21, 26, 36-37, 40-42, and 55; *The Economist*, May 15, 1954, Special Insert on "Turkey," pp. 1, 4-5, and 11. International Bank for Reconstruction and Development, *The Economy of Turkey*, Report of a Mission, Washington, 1951, especially Chap. V; International Monetary Fund, *International Financial Statistics;* United Nations, *Statistical Papers*, Series H; and U. S. Dept. of Agric., *Foreign Crops and Markets* and *The Wheat Situation*.

the importance of finding improved techniques which were not laborsaving and which, being adapted to small-scale operations, did not need to await farm enlargement in order to raise agricultural productivity. On the other hand, we seriously questioned the use of high price supports, either with existing primitive techniques or with government promotion of new techniques which would substitute much scarce capital for an already redundant labor supply while benefiting most a relatively few medium to large landholders.

Despite our recommendations, the Turkish government continued to put major emphasis upon farm mechanization and high price supports. The number of tractors, which had already grown from 2,500 to 10,000 during 1948-50, continued to increase to 35,000 (well in excess of Brazil's 22,000-30,000) by 1953. Furthermore, following the upsurge in world wheat prices resulting from the Korean war, the Turkish government continued to advance its very high price supports on cereals as export prices weakened substantially after 1951.

Of course, Turkey's agricultural development program was not limited to mechanization and price supports. Between 1948 and 1952, the Agricultural Bank of Turkey increased its outstanding public farm credit (albeit by inflationary means) more than fourfold, with about one-third of the increase in direct loans to farmers earmarked for machinery and equipment purchases. The excellently managed road-building program helped to bring more Turkish farmers and idle land into the market economy. The government distributed about 1.8 million acres of previously uncropped land to families and villages, and the amount of land under irrigation increased by about 15 per cent. The public seed-improvement program made considerable progress and the supply of fertilizers (two-thirds imported) increased more than fivefold. Agricultural research and extension activities also were gradually expanding but, with the major appropriations going to the independent price support and agricultural credit agencies, the 1953 budget of the Ministry of Agriculture was still only about 25 million dollars.

Whatever the combination of reasons, it is certain that Turkey did enjoy a remarkable expansion in agricultural output during 1948-53. Cereal production increased from 9.0 to 14.3 million metric tons and cotton lint production from 58 to 140 thousand metric tons. Wheat exports rose from nil to 587,000 tons, Turkey (thanks to Argentina's default) achieving at least temporarily fourth place among the world's wheat-exporting nations. Cotton exports rose from 16,000 to 100,000 metric tons. In 1952, the index of Turkish agricultural production was 47 per cent above its 1948 level, and the index of industrial production was 33 per cent higher (a year later 49 per cent higher). According

to the *Economist,* Turkish national income (in current prices) increased from 8.1 to nearly 12 million Turkish liras during 1948-53 while per capita national real income increased 21 per cent during 1950-53. If these data are correct, they indicate that per capita real income—which approximated its 1938 level in 1948 and 1950 and stood at only 84 per cent of 1938 in the bad harvest year 1949—rose spectacularly during 1950-53.

Frankly, I suspect that the actual rise in Turkey's per capita income was considerably less. At least it is quite possible that faulty price deflators and the dominant importance of agriculture (with its heavy dependence upon natural conditions which were extraordinarily favorable during 1951-53) have served to exaggerate the extent and permanence of Turkey's recent economic progress. Furthermore, as we shall see later, nature and economic events have taken a less favorable turn during the past year. Nonetheless, having seen and sensed the great strength of Turkey's will to progress, I feel confident that—however uncertain the quality of Turkish national statistics—the recent pace of its economic development has in it much of real substance. Hence, an appraisal of the virtues and shortcomings of Turkey's recent agricultural development policies would appear to be in order. Before doing so, however, let us look briefly at the recent expansion of two major Turkish crops—cereals and cotton—and attempt to assess the factors responsible for the increased production of each during 1948-53.

Cereals, produced under semiarid conditions, account for around 85 per cent of Turkey's cropland harvested and for perhaps 40 per cent of its net agricultural income. In his recent study, Professor Brandow found that a significant part of the sharp increase in Turkish cereal production during 1948-53 was due to weather, which was unusually favorable during 1951-53. Thus, he estimated that 1953 cereal yields were 22 per cent higher than normal weather yields with improved practices then in use; that weather alone caused 1953 yields to be about 10 per cent above 1948, when growing conditions were also above average; and that, in conjunction with increased area, this higher yield accounted for nearly one-fourth of the increase in cereal output during 1948-53. Supporting Brandow's judgment about the importance of weather, the 1954 cereal crop (wheat and barley), with much less favorable weather, yielded one-third less per acre than in 1953. In light of previous experience, one would expect this decline in cereal production to be reflected in some decline in Turkey's national income for 1954. Nevertheless, Turkish cereal production in 1954 was more than double its 1949 low and, despite a 10 per cent lower yield, was still 26 per cent above its level in the good-weather year 1948. Thus, quite independent of the weather factor, cereal production has shown a marked increase since

1948—primarily because of the sharp increase in the area planted to cereals. During 1948-53, cereal acreage increased by 7.4 million acres (nearly 40 per cent), largely at the expense of poor-quality grazing lands and unused fields.

Undoubtedly, the most important factor in bringing about this increased area in cereals has been the Turkish government's high price support program. For the crops of 1952-54 (and, prospectively, for the 1955 crop), the government's *Toprak* office has been supporting wheat prices at levels about a third higher (at the official exchange rate) than present high US price supports. The effects of these supports on increased acreage have been further enhanced by improvements in transportation and a doubling of the number of government grain-buying stations. Although only about 12 per cent of the 1952 cereal acreage was cultivated with tractors, mechanization also contributed to the increased area by making possible the tillage of a larger area of cropland. Mechanization also helped to raise yields per acre, although only a strikingly small part of the increase in total cereal output was attributable to yield-raising practices (improved seed, fertilization, etc.) other than those associated with mechanization. According to Brandow's estimates (*op. cit.*. pages 40-41), with normal weather throughout 1948-53, expected cereal output in 1953 would have been 43 per cent higher than 1948 expected output. Brandow estimates that each of the following factors in isolation would (with normal weather) by 1953 have added the indicated percentage to 1948 normal output: favorable prices and markets (increased area), 12 per cent; mechanization (effects about equally divided between "increased area" and "improved practices"), 10 per cent; improved transportation (increased area), 5 per cent; seed improvement, 2 per cent; fertilization negligible; and area-increasing intangibles 14 per cent. Of the estimated 43 per cent increase in cereal output with normal weather, five-sixths was credited to increased area and only one-sixth to improved practices.

Cotton lint production in Turkey increased nearly threefold between 1948 and 1952, its acreage more than doubling and its yield per acre 25 per cent higher in the latter year. In 1953, with some cutback in acreage and yields, production was about 15 per cent lower (616,000 bales) but still about 2.4 times its 1948 level. Undoubtedly, a major part of this increased output was due to the tremendous boom in cotton prices which the Korea outbreak created. During 1950-51, Turkish cotton prices more than doubled and acreage expanded sharply as the United States put a temporary embargo on its own cotton exports. While subsequent declines in prices brought some contraction in acreage in 1953 and 1954, Turkish cotton acreage and production remained

well above their 1950 level and far above 1948. Meanwhile, mechanization of cotton proceeded at a rapid pace, 56 per cent of the cotton in the Mediterranean and Aegean regions being cultivated with tractors by 1952. Brandow has estimated that the normal-weather yield of seed cotton increased about 7 per cent during 1948-53 as a result of the use of improved practices on a greater proportion of the land in cotton. Meanwhile, the area in cotton doubled between the two years. Of the factors (other than intangibles) accounting for the increased area in cotton, he gives about equal credit to favorable prices and mechanization. Of the factors representing improved practices, he gives major weight to mechanization, with irrigation, seed improvement, and fertilization also making significant contributions to the increased output. On the assumption of normal weather throughout 1948-53, Brandow estimates (page 42) that each of the following factors in isolation would by 1953 have added the indicated percentage to 1948 normal output: mechanization, 53 per cent (via increased area, 24 per cent; via improved practices, 29 per cent); improved seeds, 10 per cent; fertilization, 6 per cent; and area-increasing intangibles, 8 per cent. Of the estimated 115 per cent increase in cotton output with normal weather, half was attributed to increased area and half to improved practices. However, Brandow emphasized that he assigned to increased area only the production that would be obtained from it by primitive methods. Hence, as he explicitly recognized, his methodology proved awkward for cotton, appearing to understate the importance of area.

So much said by way of summary and background, let us turn to an appraisal of Turkey's recent agricultural policies.

II. *An Appraisal of Recent Turkish Agricultural Policies*[8]

Turkey's farm mechanization program has probably received the most popular credit for the nation's recent agricultural progress. To what extent has this farm mechanization program been sound development policy? On the credit side, mechanization has made a significant contribution to both the area under cultivation and to higher yields. Brandow has estimated that about 17 per cent of the new land added to cultivation of field crops (17 per cent for cereals; 32 per cent for cotton) during 1948-52 was developed by tractors. A recent University of Ankara survey of mechanized Turkish farms found that—because of more effective, better timed, or more frequent tillage and seeding

[8] Most of the data in this section are derived from Brandow, *op. cit.*, pp. 9-10, 16, 23-24, 26, 41-42, 45, 53-54, and 56; and from *Economic and Social Aspects of Farm Mechanization in Turkey*. A Study by a Committee of the Faculty of Political Science, University of Ankara. Sponsored by the MSA (FOA) Mission to Turkey, Ankara, 1953, mimeo., pp. 6-8, 14-18, 20, 25, 30-36, 48-50, 62, 64-69, 70-76, 78-79, 83, 86-89, 91, 94, and 96-98. The latter survey, made in mid-1952, included a sample of 3,015 mechanized farm families, constituting about 4 per cent of all families in 448 of Turkey's most mechanized villages.

operations—mechanization produced substantially higher yields than did primitive techniques. Brandow's estimates also suggest that, exclusive of the weather factor, 23-25 per cent of the 1948-53 increase in "normal" output of cereals and cotton was attributable to mechanization. Furthermore, through 1952, Turkey's net investment in farm machinery had probably more than paid for itself in terms of increased foreign exchange earnings, net of costs of importing replacements, spare parts, fuel, and oil.

However, with export prices falling, with the existence of export surpluses of cereals highly dependent upon the vagaries of weather, and with the larger farms now substantially mechanized, these factors hardly justify a comparable rate of additional mechanization in the future. In fact, it is quite possible that mechanization of Turkish agriculture has already been carried too far. In 1952, the annual amount of cropland (owned, rented, or worked on a custom basis) cultivated per tractor on Turkey's mechanized farms was probably about 160 acres and the undepreciated machinery investment per acre of cultivated land was about $27. But 43 per cent of Turkey's tractors were in regions whose mechanized farms averaged only 49-86 acres per tractor. To be sure, the remainder of the tractors were in three regions with 165-496 acres per tractor. In the regions having the greatest numbers of relatively large farms, machinery investments per acre approximated that of medium to large commercial farms in the United States. Undoubtedly, many of the larger Turkish farms (if not too much fragmentized) can utilize existing farm machinery rather fully and might invest profitably in still more machinery, particularly complementary tractor-drawn equipment which has lagged behind the expansion in tractor numbers in Turkey. Nonetheless, it is clear that many of Turkey's mechanized farms are already well below the size considered necessary for reasonably efficient utilization of machinery in the United States, where labor is relatively much scarcer and where machinery and fuel are much less expensive and require no foreign exchange. Hence with only about 3 per cent of Turkey's 2.5 million farm families holding over 123.5 acres (a third or more in fallow), the number of tractors in Turkey would appear to be close to the saturation point pending substantial farm enlargement.

Through 1953, the Turkish farm mechanization program had probably directly benefited only 25,000-27,500 (scarcely over 1 per cent) of Turkey's farm families. These few families probably enjoyed average annual gross cash incomes in excess of $15,000 each and were the recipients of at least 25 per cent of the public farm credit outstanding to all Turkish farmers at the end of 1952. Such an initial concentration of agricultural credit upon the medium to large farms, whose produc-

tion can most readily respond to improved conditions, was probably wise. The extent to which such intermediate-term farm credit should have been almost wholly confined to machinery and equipment loans is less certain. Insofar as mechanization brought additional land into cultivation which would otherwise (at constant prices) have remained virtually unused, the value of additional output in excess of machinery investment and operating costs was a clear gain to the nation, since no agricultural workers needed to be displaced by the machinery. During 1948-52, the average tractor-owning family in Turkey increased its average acreage operated, exclusive of custom work, by 31 per cent. Brandow has estimated that two-thirds of this increase in cultivated area was previously uncultivated. To the extent that this was true, Turkey's mechanization program would appear to be largely warranted, assuming that the new land would not otherwise have been brought under cultivation.

On the other hand, to the extent that mechanization resulted in tractor-owning families acquiring additional land previously cultivated by others, the answer is much more complex. In this case, the increase in gross value of product per acre—whether by an increased yield of the same crop or by the substitution of a more intensive crop—attributable to mechanization is less likely to exceed the net costs of the mechanized techniques. Furthermore, the social problem of displacing agricultural workers by machinery may well arise. Of course, insofar as tractor-owning farmers acquire by rental or purchase the use of previously cultivated land from owner-operators, the displacement is presumably voluntary, with the former operators somewhat better off than before. However, the same is not true if the additional land acquired by mechanized farmers was previously cultivated, for these or other landlords, by tenants and sharecroppers. Under the latter circumstances, the mechanized farmers might achieve large economic gains while displacing former tenants or sharecroppers who lack alternative employment opportunities.

The Turkish mechanization program has apparently already unduly encouraged such deleterious social effects. With the increasing pressure for additional land in Turkey's mechanized villages, land disputes have become more frequent, while marked changes in land tenure have followed mechanization. Sharecropping has decreased while cash rental of land has increased, with a larger proportion of landowners working their own land since mechanization. At the same time, the percentage of mechanized farmers who hire farm workers has increased but the number of full-time hired workers has tended to decline in favor of temporary hired labor during the busy seasons only. With mechanization increasing the seasonality of labor requirements, temporary migra-

tory labor has become more important, and cash wages have largely displaced wages in kind. Thus, insofar as Turkish mechanized farmers have taken over land previously cultivated by tenants or sharecroppers, the latter appear to have suffered a steady reduction in their share of the crop, usually ending either in a shift to the status of seasonally hired day labor or in complete displacement.

Upon the basis of the University of Ankara survey, I have estimated that each new tractor during 1948-52 resulted in the gross displacement of about 3.4 sharecroppers. Projected to all Turkey, these estimates suggest that around 79,000 sharecroppers (71 per cent of them in the two major cotton regions) were so displaced, about 64,000 of them remaining in their villages. By regions, the displacement ratio was 8.9 sharecroppers per tractor in the Mediterranean, 5.9 in Southeastern Anatolia, 0.8 in Central Anatolia, and 1.8-2.4 in the other three survey regions. Of course, some of the sharecroppers—especially those who were able to obtain well-paid and *nouvelle élite* jobs as tractor drivers or mechanics—improved their well-being as hired workers. Particularly, the doubling of cotton acreage was an important offset to otherwise declining labor requirements, and it is significant that the survey villages apparently experienced considerable net in-migration during 1948-52. Nonetheless, against the gains through increased yields per acre to the mechanized farmers, some of their hired workers, and the nation must be weighed the probable substantial net increase in numbers of underemployed villagers who, lacking alternative farm or nonfarm employment opportunities, have had considerable reductions in income. This income-distribution problem has been further aggravated by the fact that even the wealthiest Turkish farmers pay no income taxes on soil products and only negligible property taxes.[4]

To sum up, the Turkish farm mechanization program has probably been justified to the extent that it has been an independent factor in increasing the nation's total cultivated area. Where it has involved taking over land previously cultivated by owner-operators, its economic contributions are less certainly positive but its social costs have been negligible. But insofar as it has displaced tenants and sharecroppers

[4] Cf. Ankara Faculty, *op. cit.*, pp. 48-50; and Richard D. Robinson, "Tractors in the Village—A Study in Turkey," *Jour. Farm Econ.*, 1952, pp. 451-462. By way of contrast, mechanization of cotton in the Southern United States has thus far avoided these important social costs. While the effects of mechanization upon tenure status have been strikingly similar in Turkey and the American South (cf. Harald A. Pedersen and Arthur F. Raper, *The Cotton Plantation in Transition*, Miss. Agr. Exp. Sta., Bul. 508, 1954), few if any sharecroppers have been displaced in the United States. Instead, as better job opportunities have developed elsewhere, largely outside of agriculture, Southern sharecroppers have voluntarily migrated on a large scale. With agricultural labor becoming scarcer and wage rates higher, Southern plantation owners have been forced to mechanize in economic self-defense.

without concomitant expansion of better alternative employment opportunities, it has already pressed beyond the limits of Turkey's present socioeconomic structure. Certainly, any further increase in the number of what might be called "Bayar's oxen" (tractors) should largely await more "Ataturk minarets" (smokestacks).

Nevertheless, the recent great influx of tractors (less than one-fourth of them via Marshall Aid) has become the symbol of Turkey's agricultural renaissance. And one should not dismiss too lightly the importance of symbols in inspiring an underdeveloped country with a strong will to make progress. However, the arrival of the tractor has not directly helped Turkey's 2.5 million small farmers, of whom a substantial majority still use wooden plows and a negligible number use even simple animal-drawn grain drills. At the same time, the tractor has diverted far too much public attention and resources away from the peasantry which constitutes 65-75 per cent of the Turkish population.

Thanks to a combination of favorable circumstances (including the fortuitous events of the Korean commodity price inflation and extraordinarily good weather), Turkey has achieved a remarkable agricultural expansion since 1950. In view of this success, the recommendations of our Bank mission report respecting Turkish agricultural development undoubtedly appear, with the benefit of hindsight, to have been overly cautious and pessimistic. It is clear that we underestimated the opportunities for expanding rapidly Turkey's total area under cultivation. We recognized in 1950 that Turkey faced considerable difficulty in even maintaining its modest level of per capita food consumption. We further recognized Turkey's heavy dependence upon raw agricultural land (in 1951 purchased inputs and depreciation amounted to only 19 per cent of Turkey's gross farm income) in expanding its food supply but failed fully to appreciate the possibilities of increasing the inputs of cultivated land. Apart from increased cultivated area and shifts from livestock to cereals, Turkey can increase its agricultural output relatively little by transferring resources from nonfarm sectors to farms because so large a part of its total resources is already employed in agriculture and because so small a part of its agricultural resources is supplied by the nonfarm sector which, in turn, cannot readily employ those agricultural resources (labor) in substantial oversupply. In the United States, on the other hand, less than 10 per cent of its resources are committed to agriculture and a large part of American agriculture's production expenses (two-thirds of gross farm income) represents inputs that are either purchased from, or can readily be employed in, the nonfarm sector. Under these circumstances, the United States can (with little change in the area of agri-

cultural land) quickly expand its food supply in time of war or other emergency whereas most underdeveloped countries (given a constant land supply) can expand theirs little if at all. (T. W. Schultz, "The Supply of Food in Relation to Economic Development," *Economic Development and Cultural Change*, December, 1952, pages 245-247.)

During 1948-53, while the total area planted to crops expanded from 23 to 32 million acres, the area in cereals grew from 20 to 27 million acres and, according to Brandow, may ultimately reach a maximum of 32 million acres. Clearly, most of this increased cultivated area must have been developed with traditional primitive methods, implying that many nonmechanized farmers were given the incentive (through higher prices and improved highways) to work harder than before. Furthermore, it demonstrates that the elasticity of supply was higher at relative farm prices above those prevailing in 1950 than we might have expected.

To a large extent, however, this kind of elasticity was not relevant because 1950 prices (particularly for cereals) were already too high, given existing high-cost, low-productivity production methods. In other words, much of the land recently brought under cultivation would have continued, except briefly during the Korea-induced price flurry, to be submarginal (with unchanged techniques) in the absence of the subsequent rise in already high cereal price supports. Furthermore, since the expansion of cereals was largely at the expense of pastures, a serious imbalance in Turkey's livestock economy is at hand. During 1948-52, the total number of sheep, goats, and cattle continued to increase in spite of a 20 per cent reduction in pasture area, resulting in intensified overgrazing even though moisture conditions (except in 1949) were very favorable. Hence, pasture and livestock improvement and expanded production of feed grains, largely neglected to now, loom even larger as a major problem for further agricultural development. Only insofar as the increased area in cultivation would have resulted, at constant or lower relative prices, from recent improvements in transportation, the growth of government buying stations, and mechanization (i.e., by factors which shift the supply curve to the right) can it be counted as a clear economic gain. Otherwise, only if the reduction of the supply in response to a lowering of price supports would be substantially less elastic than the actual expansion which followed higher price supports (a not unlikely prospect) can the expanded area be counted as a further partial gain to the Turkish nation. Hence, given the relatively small importance of improved practices (apart from those resulting from mechanization) in Turkey's recent agricultural expansion, our recommendations for increasing the productivity of existing cultivated land, pastures, and livestock need renewed emphasis at the present time.

III. *Lessons from the Turkish Experience*[6]

Clearly, Turkey deserves credit for recognizing, after a long period of forced-draft industrialization and sad neglect of its agriculture, that agricultural development is of co-ordinate importance in balanced economic progress. However, as the recent unfavorable turn of events in the Turkish economy is now making clear, the Korean war and several years of excellent weather were not unmixed blessings despite the temporary boost they gave to agricultural development in Turkey. While the Korean war gave a brief fillip to world wheat markets, the subsequent rise in world wheat stocks (at an all-time high in mid-1954) and the fall in world prices have pushed Turkey into increasingly heavy export subsidies, estimated at more than 40 million dollars on the 1953 wheat crop alone. Only thus were the Turks able to dispose of their wheat surplus abroad (much of it through unsatisfactory barter deals with Spain, Yugoslavia, and other non-EPU countries) in spite of its high price, poor quality, and lack of standardization. Furthermore, it now appears that Turkey's poor 1954 cereal crop has eliminated for the current year any export surplus, some 500,000 tons of wheat imports being in prospect to meet urban food needs. Similarly, during the 1953-54 season, Turkish cotton exports of 377,000 bales (60 per cent of domestic production), while at the second highest level in history, were down 14 per cent from a year earlier. More significant, the bulk of Turkey's cotton trade shifted from Western Europe to non-EPU countries with which it made barter arrangements, the latter's share increasing from 22 to 64 per cent in a single year.

Thus, the temporary opportunity to sell at high prices cereals and cotton of poor and unstandardized quality was permitted to divert attention from the importance of adopting promptly a modern system of grades and standards, in the absence of which Turkish exports now face strong resistance in world markets. Furthermore, cereal production has not yet been put on the more efficient basis necessary if it is to be able to continue at its recent high level without abnormally good weather and present huge public subsidies. In the process, the hope that wheat and cotton exports would play a large part in solving Turkey's foreign trade problem has been only partially realized, while the considerable potential of its livestock economy has continued to face official neglect. Meanwhile, in seeking to encourage agricultural expansion, the Turkish government has used centralized con-

[6] The data in this section are based upon Brandow, *op. cit.*, pp. 9-10, 53-56; Ankara Faculty, *op. cit.*, pp. 25, 30-31; *The Economist*, *loc. cit.*, pp. 1-2, 4-5, 10-12; and recent issues of United Nations, *Monthly Bulletin of Statistics*, and U. S. Dept. of Agric., *Foreign Crops and Markets* and *Foreign Agriculture Circulars*. Cf. *The Economy of Turkey*, *op. cit.*, especially pp. 67-73, and William H. Nicholls, "Domestic Trade in an Underdeveloped Country—Turkey," *Jour. Pol. Econ.*, 1951, pp. 463-480.

trol—exercised through the public grain monopoly and the nominally private large agricultural sales co-operatives—to short-cut many problems of transport and communication (e.g., grading and market news service) whose solution is a prerequisite to the development of efficient private farm marketing enterprises.

Despite the tremendous expansion of agricultural credit, the Turkish government has continued to concentrate (apart from machinery credit) on short-term production credit which has done little to build up the farmer's permanent productive capacity. Insufficient attention has been given to the evaluation of loan applications and to the supervision of the uses to which loans are put. As a result, the distribution of farm credit has been far more haphazard and less productive of improved farming practices, especially for small farmers, than it might have been. Similarly, high price supports have not benefited small peasants much because they have so little to sell. In fact, it is clear that, with half of its budget devoted to defense, Turkey has pushed agricultural development largely via the inflationary route. The manifold increase in credit, especially agricultural, and the method of financing the cereal subsidy and the stock-piling of cereals have greatly increased inflationary pressures. At the end of 1953, the supply of currency and demand deposits was 75 per cent above its 1950 level. The cost-of-living index (1948 = 100) moved from 104 to 112 during 1950-53 and then in the first half of 1954 climbed rapidly from 113 to 128. Despite the poor 1954 cereal crop, Turkey should be able to maintain during the current crop-year its per capita cereal consumption at somewhat above its 1948-49 level. However, the probable high income elasticity of demand for cereals among urban workers with rising money incomes may (despite large wheat imports) favor further inflation, especially if producers should maintain their recent level of cereal consumption at the expense of marketings.

By mid-1954, the Turkish government was forced by these unfavorable developments to embark on at least a limited anti-inflation program, largely aimed at restriction of nonessential imports. It is to be hoped that, in the process, it will also scale down to more manageable levels its overgenerous distribution of agricultural credits (particularly for machinery), its present excessive cereal price supports, and its more ambitious large-scale irrigation schemes, while imposing a heavier tax burden on at least its richer farmers. Such a reversal of recent inflationary policies, which helped to keep Turkey's Democratic Party in power by a thumping majority in May, will require much economic wisdom and political courage in high places. Nonetheless, it should now be clear that indiscriminate mechanization, credit expansion, and price inflation have not proved to be the easy way out that they once ap-

peared. While moderation of these policies might result in some contraction in present agricultural output, the social costs of subsidizing present inefficient farming techniques are far too heavy for so poor a country as Turkey to bear them much longer.

Such counsel does not mean an abandonment of Turkey's agricultural development objectives. Rather, it means a shift of emphasis to other means which will more adequately meet the fundamental needs of Turkish agriculture, particularly those of its dominant peasant population, over two-thirds of whom have landholdings of less than 12.3 acres and nine-tenths less than 24.7 acres per family. In my opinion, the solution lies in the Turkish government at last facing up to the plight of its villages by developing a direct, determined, and persistent attack on the low productivity which lies at the roots of village poverty. Like other underdeveloped countries, Turkey has tended to follow—first in industry, now in agriculture—what I would call the "showcase" type of economic development. That is, at the expense of the population at large, some small group of producers is heavily protected, subsidized, and otherwise favorably treated to become a symbol of progress in which few of their fellow citizens can share. A few islands of privilege in a sea of poverty are nonetheless a poor indicator of economic development. Genuine economic progress must be broadly based, usually requiring a radical reorientation in government policy toward much larger investments in rural welfare.

To a large extent, this means a substantial increase in public investments in the education, health, and practical agricultural knowledge of village people and in the technical personnel to make such investments effective. Particularly, the quality of present agricultural research personnel and programs needs much improvement and the achievement of a broader and more effective dissemination of research findings at the village level deserves top priority. Since a mere 1 per cent increase per year in Turkey's total agricultural output would pay for its present annual investment in the activities of its Ministry of Agriculture, far greater budgets (particularly for its extension service) appear to be warranted. These public services should give a major part of their attention to developing simple improvements in tools and practices which will raise productivity per worker without reducing present per acre inputs of labor or animals, which must in any case be maintained on small holdings. Nor, in Turkey's case at least, does it appear likely that an increased rate of net population growth in the rural areas will dissipate the resulting gains in output. If a choice must be made between maintaining the present levels of agricultural credit and improving and expanding the research and extension services offered to small holders, the latter should be given priority. However, such agricultural

credit as is extended to small holders should be closely co-ordinated with the recommendations of the extension service and might often be more effective if granted in kind (pure seeds, fertilizer, etc.) rather than in cash.

Apart from encouraging the widest possible adoption of practices which enable the peasant to produce more with his limited land resources, the extension service should also seek to find means of occupying profitably the otherwise idle time of village people. The development of village industries—such as farm tools and implements, hand-woven textiles and other handicrafts, and the simpler agricultural processing industries—recommends itself. So does the encouragement of co-operative endeavor on small-scale public works—such as village roads, schools, and local irrigation projects—with the government furnishing only the materials and technical assistance. Such projects have the advantage of low capital requirements, which with further economic progress will involve no important liquidation loss, while meanwhile improving the levels of living and working habits of otherwise underemployed villagers. At the same time, they can arouse in the villages the spirit of community self-help which, while now sadly lacking, is a cornerstone of general progress anywhere.

On the marketing side, Turkey needs to make more public agricultural investment in its commodity standardization and inspection program. It also needs to develop satisfactory current agricultural marketing and price statistics, agricultural outlook information, and research and extension in farm marketing and prices—basic public services which are essential if Turkish peasants and private middlemen are to be integrated into an efficient and well-organized national economy without continued centralized dominance and control of agricultural markets by the government itself. Even the large-scale agricultural sales co-operatives virtually owe their existence to the government, which has maintained rigorous control over their management and finances. The development of more democratic farmer co-operatives at the local level by an expanded extension service would appear to be highly desirable on both economic and social grounds. Finally, there is a need for a continuing program of industrialization in which the simpler agricultural processing industries, both co-operative and private, play a larger role than they have done in the past.

Upon the basis of Turkey's experience, I may sum up in a few words my conclusions on desirable directions for agricultural development policy in underdeveloped countries. In general, more agricultural investment should be allocated to people (intangibles) than to things (tangibles) but, insofar as it is allocated to things, it should usually emphasize the small and inexpensive rather than the large and spectacular. Simple

and obvious though such conclusions may appear to be, they are almost universally ignored by underdeveloped countries. However, in so doing, underdeveloped countries confuse the symbols with the substance of the industrial nations of the world. Important though symbols may be in sparking a spirit of progress, their continued overemphasis can only mean the substitution of recurrent boom-and-bust for the slow-but-sure. Conservative that I am, I would strongly recommend to such countries the latter course.

DISCUSSION

EVERETT E. HAGEN: These two stimulating papers bracket a wide range of problems in economic development. To hold my comments to brief compass I shall limit myself to two topics: the implications of the two papers concerning general criteria for the allocation of investment in economic development, and some aspects of the specific model presented by Professor Chenery.

From the titles of the papers and from the fact that Professor Chenery's paper stresses the development of industry and Professor Nicholls' that of agriculture, it might seem that the two papers are in conflict concerning the question of emphasis on industry versus that on agriculture in the process of growth. In fact they are not—or, if they are, it is because of a difference between them relating to another issue to be discussed below. Professor Nicholls' paper does not deal with agricultural development versus industrialization; it deals with choice between two methods of developing agriculture. On the other hand, while Chenery states that he is concerned mainly with selection among manufacturing and processing industries, he really presents a method of selection among all sectors of the economy without prejudice to the degree to which agriculture on the one hand or industry on the other will be indicated by the analysis.

Further, there is no issue between them concerning linear programing versus partial or marginal analysis as the best tool for determining the allocation of investment which will maximize the increase in national income. There is little question that for such analysis linear programing is the superior tool. There is no issue here—except perhaps between the enlightened and the unenlightened. Linear programing can deal with the composition of output, price relationships, foreign exchange relationships, and alternative production methods far better than can partial analysis. These advantages result from the nature of economic development; namely, that the economy is changing, not marginally, but in all parts at once and in some parts by large increments or large structural changes. Change in each part of the economy affects other parts, and none can be analyzed without simultaneously analyzing all.

However, this is not a principle which Mr. Nicholls disputes I think that there is an implicit issue dividing the two papers, but it is not this. It is rather the issue of what criteria should govern the selection of economic sectors for development and of development methods.

Chenery discusses only one criterion: "to secure the greatest increase in . . . income (total or per capita) . . . in the long run," or, what amounts to the same thing, to minimize the inputs required for a given increase in output. But Nicholls, after tipping his hat with a properly respectful gesture to the principle of maximization of income, spends his energies discussing two other criteria.

One of these is the distribution of the economic benefits of development. He refers, not in a simple way to the distribution among income size groups, but to the distribution among sectors of the economy. His concern is valid. The criterion is sound. The benefits of industrialization will for many years reach only a limited group.

Introduction of new industry at a rate sufficient to give employment to 1 per cent of the labor force per year is an extremely rapid rate of industrial expansion. Over a period of a decade, even this rate of industrialization will benefit directly only approximately 10 per cent of the population if indeed the available human skills and motivations are such that in the short run it benefits anyone, which it may not. The agricultural population from which the new industrial workers are drawn will benefit only insofar as reduction of underemployment increases per capita income, or insofar as the industrial workers contribute to family income back in their home villages.[1] In economies in which two-thirds to three-fifths of the population is dependent on agriculture, this is not enough. It is quite possible, and even probable, that in most predominantly peasant societies a government cannot remain in power for a dozen years by democratic means unless its development program gives direct widespread benefits to the peasant population.

It is worth noting that agricultural development may be desirable for a quite different, purely economic reason; namely, to provide a market for industrial output. The extent to which any given increase in agricultural income will increase the demand for industrial products can be estimated by a linear programing model. It is the social rather than the purely economic benefits of agricultural development with which a linear programing model cannot cope adequately.[2]

A third criterion, with one aspect of which Nicholls also deals, is the social costs of the increase in aggregate output. He discussed the displacement of peasant operators by the mechanization of agriculture. The social costs involved in rapid industrialization are less simple to portray but nonetheless real. Obviously, a development program must not be abandoned merely because it involves such social disruption. Otherwise there will be no development. Any economic change involves social change, and social change involves social cost. But the social costs must not therefore be ignored. The costs involved in one program differ in amount from those in another, and even

[1] J. H. Adler noted in discussion from the floor that industrialization will itself benefit the agricultural population in some economies by increasing the demand for the type of food or other agricultural product produced in peasant farming and thereby raising the price of those products. This qualification is of course entirely appropriate. Adler noted that in this case there is often a tendency for the government to restrict the rise in price of agricultural products because of its interest in protecting urban workers from the increase in living costs.

[2] In comment from the floor, Professor T. C. Schelling suggested that a linear programing model can explore the benefits of increasing income throughout agriculture by dividing labor into several groups, one of which is agricultural labor, so that the model will show the demand for agricultural labor. However, if at the completion of the analysis there is still surplus agricultural labor, so that the shadow price of labor is still zero, a linear programing model will indicate nothing whatever about the desirability of emphasizing agriculture rather than industry in a development program. This is the deficiency which I have in mind.

though they can be measured only imperfectly they should be taken into account in determining the optimum allocation of effort.

Linear programing disregards these two criteria. It does not follow that linear programing must be rejected. It follows merely that the answers given by even a perfect linear programing model are only partial answers, and that even though the three criteria are only imperfectly commensurable, all must be taken into account.

So much for the general implications of the two papers concerning criteria for investment allocation. Now, a few comments concerning the specific development model presented in Chenery's paper.

The virtues of the linear programing process, even with regard to the one criterion of maximizing aggregate income, do not necessarily inhere in any given linear programing model. The simpler and computationally more manageable a model, the greater is apt to be the margin of error in the estimates it yields.

Professor Chenery's model illustrates this point. It is after all a very limited model. For ease of computation it contains only fourteen sectors; aggregation to this point certainly blunts the edge of the tool. Further, the model assumes fixed production functions. Variation in the ratio of labor to capital is accomplished only by choice from among different products. But one of the considerations which may be of primary importance in the development of many economies in which underemployed labor is present on a large scale is the question which among alternative methods of producing a given good will yield the greatest total employment or the greatest aggregate income. Again, the model makes only crude allowance for capital durability. It assumes, that is, that if one capital good costs three times as much as another, it constitutes three times as costly an input in production. It does not take account of the fact that the more expensive capital item may endure six times as long, and thus constitutes roughly only one-half as costly an input in the production process. This, too, is an important omission. For in an economy short of capital, as elsewhere, the question of the roundaboutness of production, the period of gestation, the appropriate rate of discount of future income is of first-rate importance in planning economic development Fourth, Chenery's model does not take into account the relative feasibility of alternative development programs. It assumes that management ability, technical knowledge, skills, and motivations will be as available for one type of project as for another. In fact, they may not. Finally the model makes no allowance for increase in productivity in specific production processes, though it makes allowance for increase in productivity for the economy as a whole through the utilization of previously unutilized labor. Yet almost by definition the process of economic development must include improvements in productivity in specific production processes.

But even though the model is less informative than otherwise because of these restricted features, this fact does not imply any criticism whatever either of linear programing models in general or of Chenery's model in particular. This is true for three reasons:

1. Each of the five limitations indicated is due either to deliberate simplification for purposes of easier presentation or to the absence of the data needed to expand the model. In all of these five respects a linear programing model can be made more realistic if the occasion demands and the data exist. The only other factor hindering the elaboration of the model is the resulting computational demands, and these are easily handled on present high-speed computors. Each type of missing information—knowledge of alternative production functions, of capital durability, of human bottlenecks, and of prospective increases in productivity—can be used at least as effectively in a linear programing model as in a "partial analysis."

2. Certain aspects of Chenery's model which are inappropriate to many countries are probably appropriate to Southern Italy. For example, in Italy managerial and technical talent and motivation may be available for almost all projects (given only top-level impetus to the total development program).

3. Finally, it seems very probable that even a rather simple linear programing model does not in general mislead because of its simplicity—that is, does not give worse results than partial analysis—but on the contrary provides valuable aid not otherwise attainable. It is worth while to remember Friedman's well-known article noting that the test of an analytical model is not the realism of its assumptions but the predictive value of the conclusions drawn from it.

Chenery has constructed a structure with imagination and a high order of craftsmanship. Its construction has given a demonstration not available previously of the power of a linear programing model in a practical situation and should be a stimulus to advance in this field. It will be recognized, I think, as a modest but nevertheless appreciable contribution to the advance of economic science.

WILFRED MALENBAUM: These two excellent papers use what are obviously different techniques in reaching decisions on patterns of investment in development programs. Professor Chenery's results come from a general equilibrium analysis in which account is taken of the interdependence of the "individual" sectors of the economy. A decision with respect to investment in industry—the sector upon which he focuses in this paper—depends upon resource availabilities and complementary investment requirements in all sectors. The analysis requires a significant amount of information, both on intersectoral flows in the economy and on the capital and labor requirements for expanded domestic output (capacity) in each sector. Comparison of some of his results with those which might be obtained by partial, sectoral analysis points up, he feels, the need for such an over-all approach.

Professor Nicholls simply asserts the need for agricultural investment in the development program of underdeveloped countries. Within agriculture, he stresses the importance of direct attention in the development program to the plight of the smaller, poorer, more underemployed agriculturist. Steps must be taken to improve his efficiency and to provide him, more or less *in situ*, with supplementary nonagricultural employment opportunities, both

of an industrial and public utilities nature. Nicholls' analysis of Turkish agricultural development activity in the recent past makes clear that the government program has not begun to meet the problems of the peasantry which constitutes 65-75 per cent of the population. Nevertheless, Nicholls' basic "explanation" for the need to concentrate directly upon this subsector of agriculture remains his insistence "that agriculture and its major subsectors must share in any real gains in per capita national income if we are to consider the claims of successful economic development valid." There is no demonstration that observed gains in per capita national income, if not shared by important sectors of the economy, are bound to prove transient and illusory. Nor is there any refutation of the proposition that real gains in per capita national income from a development program will somehow be shared by component sectors simply because of the structural interdependence of the economy.

This said, I hasten to associate myself fully with Professor Nicholls' recommendations. On the basis of my own observations and study in underdeveloped areas, both with and without "population problems," I sympathize with Nicholls' feelings that there is need to concentrate directly upon improving the economic well-being of the large rural populations. Nevertheless, it would be of great value to find in the structural interrelationships of (at least some) underdeveloped economies a more satisfactory rationale of the need for such direct action—and some measures of the relative importance to be given this type of investment in the total development program. For this, Chenery's work on general equilibrium solutions is clearly of great importance. There is no necessary inconsistency between the Chenery results and the Nicholls suggestions for emphasis in investment patterns. Chenery confines his final conclusion to the need for over-all analysis in planning industrial development. (By their very nature, however, his results also provide appropriate levels for agricultural and other nonindustrial investment.) He also indicates that investment allocations might be somewhat greater in the nonindustrial sectors of economies like that of Turkey where the marginal capital requirements in agriculture, for example, appear to be relatively much lower than in Italy.

The general model necessary for Turkey (as for India and many other underdeveloped areas) would be quite different from the one used by Chenery. In particular, the "one-way interconnectedness" of the economy which he discovers in the Italian data would, I think, have but limited relevance in these other countries. The material for Italy suggests that as per capita income increases (its distribution notwithstanding, presumably) the proportion of income spent on manufactured consumers' goods may be expected to increase. Other demands are derived from the demand for these goods. "The justification for investment in 'social overhead' facilities and in much of primary production" stems from this dependence. It is precisely the absence of evidence of such derived effects in important sectors of the economy of Turkey which provides the case for direct investment in the small-scale agricultural areas. Expansions in per capita national income arising from industrial growth or from the mechanization of a small component of agri-

cultural output do not seem to be transmitted to other important parts of the economy. For whatever reasons, consumption and production responses do not occur or are too limited in magnitude.

I must admit some uneasiness about a model of growth based upon such one-way interdependence and the simultaneous recognition of significant structural disequilibrium in the use of factors of production. Is not the existence of large underemployment in the rural sector testimony of the lack of such interdependence—in the past, if not at present? I presume that the two to three million of additional nonagricultural employment that will be provided in Chenery's investment plans are of a magnitude which will, over the decade, absorb not only the net growth in employables but also the currently underutilized labor supply. Perhaps this will indeed occur. I would feel much happier if this solution were not so apparently out of line with what has occurred in Italy in the past.

In sum, the general case for the use of the over-all approach to the determination of investment allocations is sound. Chenery's model may provide useful answers for Italy. Its extension to other underdeveloped areas requires much more knowledge about the appropriate pattern of sectoral interdependences than is yet in hand. Pending such knowledge, there is much to be said for development programs which seek to assure Nicholls' sharing of growth in per capita incomes by direct concentration upon those sectors of the economy which seem to lag.

ECONOMIC DEVELOPMENT: CASE STUDIES

COMPARATIVE ECONOMIC DEVELOPMENT: CANADA AND THE UNITED STATES

By John H. Young
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Comparisons are odious, whether involving individuals or nations, and in presenting some tentative results of a comparison which I am now making of the Canadian and American economies to a gathering containing nationals of both countries, I am aware of the delicacy of my position. It would be easy to concentrate on technical questions or to give a glowing account of the success stories of the two economies and thereby avoid controversial issues, but since it seems to me important to bring into sharp focus some of the basic characteristics of the Canadian economy, I am going to speak somewhat more frankly than might seem appropriate at this time and place. As anyone familiar with the two economies knows, the United States has enjoyed and does enjoy a substantial advantage over Canada in terms of what used to be called economic welfare. Many of us would not spend much time studying economics if we did not think that economic welfare, even if only measurable in a rough way, was of some importance. On the other hand, all of us—and here we would have the support of eminent economists from Adam Smith to Sir Dennis Robertson—would be prepared to argue that some things may be more important than opulence. Perhaps if we could broaden our concept of welfare to include political, legal, religious, and other aspects of well-being, a comparison between the United States and Canada might yield a different answer.

If we restrict ourselves to economic considerations, however, the answer is fairly plain. One hundred and thirty-six years ago a Scottish clergyman who was traveling down the St. Lawrence and had spent the night in Prescott on the Canadian side of the river, had occasion to cross over to Ogdensburg on the American side, and being struck by all the activity he saw there, remarked that "the contrast of apathy and inexertion on the one side of the river, with bustle and business on the other, cannot but be mortifying to one of genuine national feelings." He was not the first to observe a difference in the Canadian and American economies and certainly not the last. I cannot pretend to any extensive knowledge of the history of either country, but even my cursory reading has revealed that in almost every decade since the beginning of

the nineteenth century, one does not have to search far to find observers making an unfavorable comparison between the economic performance of Canada and that of the United States. It is true, that as the decades pass we hear less of apathy and inexertion and more of wage and income differentials, but the contrast remains up to the present day. Perhaps the reasons are obvious, but as Schumpeter once remarked in another connection, "Nothing is so treacherous as the obvious." The more I look into this question the more I am impressed by its complexity, and the need for a step-by-step analysis which attempts to probe beneath the surface and expose the fundamental factors at work. Given the limitation of time and space, I am going to restrict myself to a preliminary discussion of some of the consequences for the Canadian economy of two of the great national policies which have helped to create an independent political and economic unit in the northern part of the continent; namely, the transportation and tariff policies of the Dominion government. There are those who would echo the words of Pilate, "What I have written I have written," and argue that there is no point in analyzing the consequences of decisions which, while once debatable, are now a more or less permanent part of the landscape. To them I can only point out that what is said here is not intended to have any direct implications for policy whatsoever, but only intended as a contribution to a better understanding of the comparative economic performance of the Canadian and American economies. Before turning to this question, I would like to sketch in outline the comparative economic growth of the two economies in order to establish the general setting.

Any starting point is arbitrary, but given the limitations of the statistical data before 1870 and the fact that the American Civil War and the Confederation of Canadian Provinces in 1867 mark a dividing line of sorts in the histories of the two countries, the period around 1870 is as good as any. Over the whole period since 1869-70 the two economies have achieved a high rate of economic growth, and the most obvious generalization which emerges from a comparison of their economic development is that their relative position is much the same today as it was over eighty years ago. The population of both countries has increased about fourfold during the period and today, as in 1870, the continental population of the United States is around eleven times that of Canada. It is more difficult to say anything precise about the rate of growth of income per capita. In the most recent Annual Report of the National Bureau of Economic Research, Solomon Fabricant remarked that the rate of expansion in income per capita of 1.9 per cent per annum, which according to Bureau estimates has been sustained by the American economy for over eight decades, would, he suspected, find

little precedent or parallel in any other age or nation. I think from what we know of the comparative position of the Canadian and American economies in 1870 and today, it would be safe to say that for the period as a whole, the difference between the rate of growth of per capita income in Canada and the United States must have been very small indeed.

This does not mean that the rates of economic growth of both countries have been equal throughout the period. We know that in the latter three decades of the nineteenth century the population and labor force of the United States grew more rapidly than that of Canada, and we also know that positions were reversed after the turn of the century with Canadian population growth higher in each decade since 1900. There are some grounds for thinking that there has been a similar divergence in the rates of growth of real national product, but much work needs to be done before we can speak with much confidence. The publication of Dr. Firestone's ambitious attempt to measure Canadian economic growth will undoubtedly stimulate a good deal of interest in this subject and future commentators will be able to be more precise.

Taking 1900 as the dividing line on the comparative rates of growth of the two economies, the early period from 1870 to 1900 is perhaps the more interesting. Prior to or during this period several fundamental decisions were made which played an important role in determining the path which would be followed by the Canadian economy. If these decisions, which involved the economic independence of the country, had gone the other way in favor of economic integration with the United States, then the course of Canadian economic development might have differed significantly. This early period, which includes what was once known as the Great Depression, is also interesting because of the different reputation it enjoys in the economic histories of the two countries. The American literature quite rightly draws attention to some of the difficulties associated with falling prices during parts of the period, but it is also recognized that these were decades of very rapid economic growth, which in a single generation brought the American economy from a position of parity with the economies of other industrial powers to a position of world leadership. In Canadian economic history on the other hand, the period 1870-1900 gets an almost uniformly bad press. Professor Brebner has suggested that "the twenty-five years following 1873 were probably the grimmest quarter century in the history of Canada."[1] The late O. D. Skelton headed his chapter on this period with the words, "The Days of Trial,"[2] while the Royal Commission on

[1] John Bartlett Brebner, *North Atlantic Triangle* (Yale University Press, 1945), p. 221.
[2] O. D. Skelton, "General Economic History," in *Canada and Its Provinces* (Toronto, 1914), Vol. 9.

Dominion-Provincial Relations, whose report and its appendices have had something of the status of textbooks in recent years, summed up the period in the following words: "The collapse of the boom in 1873 brought on the Great Depression which continued for twenty-three years. A persistent decline in prices, a sharp shrinkage in international lending and a low level of investment caused a general stagnation. The Canadian economy strongly affected by these influences virtually stood still, although there were many internal shifts and changes."[3] This is an extreme position, but while other treatments of the period, including that of Dr. Mackintosh in his monograph for the Commission, reach a more balanced conclusion, pessimism is the rule rather than the exception. I do not think that an overly pessimistic view of this period is consistent with the evidence, but it is easy to see what could lead to such an appraisal of Canadian economic development during these years. For one thing, the level of foreign trade in both money and volume terms fell after 1873 and its growth during the rest of the period was sluggish. The importance of foreign trade in nineteenth-century Canada as a source of tariff revenue as well as a factor of prosperity, and perhaps the availability of foreign trade statistics, gave this particular barometer of national well-being too great a prominence. A similar use of foreign trade statistics would have led to a pessimistic interpretation of the American experience. Not only did foreign trade fail to expand as rapidly as had been hoped, but also the decennial censuses revealed a disappointing increase in population. During the last three decades of the nineteenth century, in spite of the fact that around one and a half million immigrants were reported landing at Canadian ports, Canada failed to retain even its natural increase. The drain to the United States was a constant source of comment, particular regret being expressed for the loss of those born in Canada. It has been estimated on the basis of United States censuses of population that over one million Canadian-born moved to the United States during the period 1870-1900, while the opposite movement of American-born to Canada was hardly one-tenth as great. By 1901, about 20 per cent of living persons born in Canada were residing in the United States. This is an old story to Canadian economists and historians and so much has been written on the subject that little need be said. There is no mystery about the motives which led too migration. Both Canadian-born and immigrants to Canada were attracted by better employment opportunities and good free land, the superior attraction of the United States during this period being closely related to geographical factors as well as world conditions. The movement of the Canadian frontier was halted by the Canadian shield which

[3] *Report of the Royal Commission on Dominion-Provincial Relations* (Ottawa: King's Printer), Vol I, p. 52.

barred the way north of the Great Lakes, while the American frontier continued to move westward, south of the lakes and beyond, until as good free land became scarce in the United States the flow was diverted north again, and returning Canadians and emigrant Americans joined those from Eastern Canada and Europe who were taking up land in the Prairie Provinces of Western Canada. Other factors played a part but the lack of a rapidly moving frontier had a serious effect on the development of Eastern Canada during these years and the flow of immigration from Canada was directed not only to the American frontier but also to the industrial towns of New England and the border states. I commend this story of an area with no frontier to those Americans who feel that the debunking of the frontier school of American history has gone too far.

While performance fell far below expectations, this does not mean there was stagnation in Canada during these years. From 1870 to 1900 the population of the country increased by just over 45 per cent—a rate of increase considerably lower than the 90 per cent growth of American population during the same period but somewhat higher than the rate of growth of American population during the thirty-year period from 1920 to 1950, and not very much lower than the 60 per cent increase of Canadian population during the same period. Moreover, such rough indicators as we have of the increase of output in manufacturing, agriculture, and other sectors of the economy point to a substantial rate of growth in output.

Around the turn of the century, the combined effect of a number of changes, including the revival in the demand for Canadian exports and the gradual filling up of the American West, began to be felt, and Canada entered the period which has come to be called the "wheat boom"—a period of rapid growth which overshadows both the twenties and the recent rapid expansion as the greatest boom in Canadian history. This period of Canadian economic history has achieved something of an international reputation from Professor Viner's use of it to test the classical theory of the mechanism of adjustment and there is no need to go into details. Within thirteen years from the census of 1901 to the outbreak of the first World War, with settlers pouring into the wheat lands of the Prairie Provinces, the population of Canada increased by almost 50 per cent as compared with an increase of only 28 per cent in the United States. Rates as high as that achieved by Canada during this period were practically the rule in the United States prior to the Civil War, and it is interesting to note that in terms of both population size and rate of growth the period 1901 to 1914 in Canada is a remarkably close parallel to the period 1801 to 1814 in the United States. That Canada has not been able to maintain a pace of popula-

tion growth as rapid as that of nineteenth-century America is evidenced by the fact that in 1854 the population of the United States had reached 26.5 million, while Canadian population in 1954 is only around 15.2 million.

Once the effect of the wheat boom had been absorbed by the Canadian economy, there is considerable similarity in the path of economic development of the two countries. The data are sketchy for the twenties and it is not until the most recent period, from 1929 to the present, that we have reasonably reliable estimates of gross national product in constant prices for both countries. For the thirties, the series for both countries show only a small increase, but from 1939 to 1953 it would appear that in both countries per capita output has increased by around 60 per cent, with the population of Canada increasing by just over 30 per cent as compared with a growth of just over 20 per cent in the United States. Given a continuing inflow of immigration into Canada, which relative to population has been about six and a half times as high as the American level during the postwar period, it appears likely that Canadian growth will continue to exceed that of the United States by a substantial margin.

To sum up, in the last three decades of the nineteenth century the population of Canada increased by 45 per cent as compared with a growth of 90 per cent in the population of the United States. Since the turn of the century, on the other hand, the population of Canada has increased by 160 per cent as compared with a growth of only 100 per cent in the United States. Such cross-section studies as I have been able to make, using estimates of wages, prices, and other information, leave me with the impression that at the terminal points of these major periods of economic development—1870, 1900, and today—the ratio between income per capita in the two countries may not have changed very greatly, although there have undoubedly been fluctuations in this ratio which will be revealed when and if we obtain better information.

Such comparisons are obviously very rough and the difficulty of obtaining any accurate measure is evident from the variety of estimates of this differential which have been made in recent years. It would be interesting to discuss some of the theoretical difficulties which arise in such a comparison, as well as the problems involved in the selection of the appropriate variant of national income, the adjustment to a common definition, and the difficulties involved in collecting price data covering not only consumers' goods and services but also investment goods and services and the cost of government services. If we are to have a reasonably precise estimate of the difference in average per capita income and product which will command general agreement, a fairly considerable research project will be required, but for present purposes a cruder

measure will suffice, and I shall simply assert that from the little work I have been able to do on this question, I would regard estimates (using either Canadian or American prices) which place Canadian gross national product per capita in the range 70-75 per cent of that of the United States, as probably accurate within a few percentage points either way. Some of this difference is more apparent than real. For example, the occupational distribution of the Canadian labor force differs from that of the United States. In the postwar period, around 20 per cent of the Canadian labor force has been engaged in agriculture as opposed to 12-15 per cent in the United States. As we all know, income statistics tend to show substantially lower incomes for those engaged in agriculture, but there are some who would argue that such statistics tend to overstate urban incomes and understate farm incomes, so that at least part of the difference arising from occupational distribution may be illusory. Much the same kind of observation could be made about another factor which plays a part in the income differential. It appears that labor force participation rates among married women and teen-agers are lower in Canada and this tends to lower per capita income relative to the United States. Whatever might be said about teenagers, we all know that there is only a statistical justification for omitting the value of housewives' services from national income, and that Pigou used the example of the fall in national dividend which results if a man marries his cook to show the arbitrary nature of such measurements. Lower participation rates for married women in Canada is incidentally an interesting piece of evidence of a difference between the two countries in what Professor Rostow has called the propensity to seek material advance. At one time the difference in the international investment position of the two countries was a factor of considerable importance, Canada being the world's largest debtor country prior to World War II, with net payments of interest and dividends equal to almost 6 per cent of national income in 1939. In recent years this has fallen to around 2 per cent, while net receipts of interest, dividends, and branch profits have totaled less than 1 per cent of US national income. Once we have stripped away differences arising from occupational distribution, the share of the population in the labor force and the international investment position of the two countries, we are still left with a hard core which appears to be of long standing.

The persistence of this income differential over a long period suggests that the factors at work are fundamental in character—perhaps even physical and climatic. Before accepting an explanation resting upon natural factors, however, we should remind ourselves that the economic development of Canada has not followed the lines dictated by "natural" economic forces. It would appear that at least two of the major Cana-

dian policies implemented during the period since 1870—transportation development and tariff protection—represent in part an interference with natural economic forces and have been widely accepted as the price to be paid for a measure of political unity and independence.

The decision to use transportation facilities as a means of unifying the country dates from at least the time of Confederation and perhaps earlier. Promises of a transportation link were made to both the Maritime Provinces and British Columbia as a condition of entry, and the Intercolonial and the Canadian Pacific Railways redeemed these promises. When offered a chance to participate in the building of the Pacific railway, the Grand Trunk, Canada's principal railway of that time, was unwilling to accept unless the transcontinental line passed south of Lake Superior. It should perhaps be pointed out that the Grand Trunk was a British company and throughout the story showed scant respect for the niceties of national boundaries. The government of that day insisted on an all-Canadian route, and Canada's first transcontinental railway, instead of joining the eastern and western portions of the country through high traffic-potential American territory, was pushed through almost a thousand miles of barren country with little immediate or even long-term prospects as a source of traffic. The same policy was at work during the next great railway building era following the turn of the century. During this period of unbounded optimism, it seemed obvious that the country needed not one but three transcontinental railways, all of which would run north of Lake Superior. The Grand Trunk again appears on the scene this time with a projected railway which would join its western subsidiary to the East by way of Chicago. Again its offer was rejected in favor of a more expensive alternative, and the National Transcontinental was built by the government from Winnipeg to Moncton on the Atlantic seaboard. The epic story of the third transcontinental railway—the Canadian Northern—deserves more than a sentence, but when it was decided that it too needed a route to the East, after a mild attempt to economize on transcontinentals by encouraging the Canadian Northern to double up, it was able to press ahead with help of guarantees from the federal government. This railway expansion was mainly financed by British investors, and in view of the fact that a substantial proportion of the capital inflow from 1901 to 1914 was used for building railways, it is easy to understand Viner's conclusion that "the borrowings during this period were in large part invested in economically unsound ventures."[4] Unfortunately for the Canadian taxpayer, the federal and provincial governments were deeply involved and when the time came to pay the piper, he had to foot the bill. Perhaps

[4] Jacob Viner, *Canada's Balance of International Indebtedness 1900-1913* (Harvard University Press, 1924), p. 305.

this was no less than just, since the government had received substantial public support for its transportation policy, although later commentators have argued that the government might have been able to drive a better bargain when it became necessary to do something about the incipient bankruptcy of the Grand Trunk, the Grand Trunk Pacific, and the Canadian Northern. It was decided that the liabilities of these railways should be assumed by a nationalized railway system—the Canadian National Railways—which took over control of all private and government railways in Canada, with the exception of the properties of the Canadian Pacific Railway. With an unco-ordinated group of railways, often with duplicate facilities, and with a capital structure which bore no relation to potential earning capacity, the Canadian National Railways was unable to meet its fixed charges, and in each year from 1923 to 1952, with the exception of two years in the twenties and the war years, the nationalized railway system showed a deficit. These deficits were at one time rightly regarded as a pretty serious business for the economy as a whole, but in general it can be said that either the deficits or the adjustments designed to put the capital position of the Canadian National Railways on a more realistic basis are a good deal less awe-inspiring today. One would expect to find some reflection of these financial difficulties in the physical statistics of Canada's railways, and it does appear that in terms of traffic output per employee the US railways make a better showing. How far this is due to the inadequacy of the measure, how far it can be attributed to the enthusiastic railway expansion of the past which has contributed to lower traffic density on the Canadian railways, and how far it is related to other factors is something on which I hope to have more to say at a later date. When reference is made to the transportation difficulties under which the Canadian economy operates, it must be remembered that while some of these can be attributed to natural factors, at least in part they are a reflection of an economic policy which accepted higher transportation costs in pursuit of other ends.

It is more difficult to assess the consequences for Canadian economic development of the policy of tariff protection. Broadly speaking, Canada at Confederation was faced with a choice of one of three alternatives: first, the retention of a low revenue tariff in the face of the high tariff maintained by the United States; second, the promotion of freer trade between the United States and Canada by prevailing upon the United States to agree to reciprocal tariff reductions; and, third, the choice which was made when attempts to obtain reciprocal tariff reductions proved fruitless: the adoption of a policy of tariff protection for Canadian manufacturing industries. This policy has been a continuing element in Canadian economic development since 1879, although through-

out the latter decades of the nineteenth century, and indeed up to the rejection of the reciprocity proposals of 1911, large-scale reciprocal reductions of the Canadian and American tariffs were always regarded as a possible alternative. Given these three possibilities, it may appear idle to speculate on what would have been the consequence of accepting some other course of action than the one actually adopted, but in order to decide whether the apparent economic costs are or are not real ones, some such attempt must be made.

Following the first course of maintaining a low revenue tariff while the United States retained a high tariff was an unattractive alternative as compared with some measure of continental free trade. One is bound to feel some sympathy for Canadian manufacturers of the 1870's who were quite prepared to meet American competition under free trade conditions but who argued that if the American manufacturer were accorded protection in his market, it was only just that the Canadian manufacturer should receive protection in his. At the same time it is well known that in the absence of rather special conditions, there is a presumption that, regardless of the tariff policies followed by other countries, any one country merely injures itself further by raising its own tariff. Are there any grounds for thinking that the special conditions required if a tariff is to provide a net economic benefit have been present in Canada? In the most detailed study of Canadian tariff policy presently available, it is held "that if Canada had kept her tariff at revenue levels without receiving reciprocal concessions in foreign markets the results would not have been advantageous as compared with existing levels of national income enjoyed."[5] It should be possible to justify this contention by reference to international trade theory, and certainly no one can complain that students of international trade have not devoted considerable ingenuity in recent years to discovering possible advantages for protection. Quite the contrary. Yet a search through this literature fails to bring to light any good argument for Canadian protection if we restrict ourselves, as we should, to long-run economic considerations. The long-run elasticities are almost certainly high enough to rule out the possibility of gaining by an "optimum" tariff any higher than a revenue level. Bargaining tariffs have a tendency to build up vested interests which prevent any easy reversal of policy, and the Canadian tariff has been no exception. Infant industries should be nurtured, but if their problem is their inability to compete with American industries enjoying the advantage of a large domestic market, then it is a fair bet that they will tend to remain infants. It is true that capital and enterprise can be attracted by a tariff, and the establishment

[5] Orville John McDiarmid, *Commercial Policy in the Canadian Economy* (Harvard University Press), p. 385.

of American branch plants in Canada has been one spectacular product of the Canadian tariff, but the flow of capital and enterprise into the unprotected sector of the economy is discouraged, and there does not appear to be any way in which a balance could be struck in deciding whether Canada has achieved a greater or smaller inflow of capital and enterprise by having a tariff. Ohlin—who discussed the Canadian case specifically—reached no definite conclusion. But if capital and enterprise have been attracted, this would imply that the return to these factors has been increased over what it would have been in the absence of a tariff. This in turn must have lowered the returns to either one or both of the other factors: land and labor. Since Canada has not had and does not have a wealthy landlord class which can be exploited, the burden then necessarily falls on the ordinary farmer or on the ordinary employee or on both. Those who argue that the tariff has had the effect of reducing migration to the United States are in effect arguing that increasing the disparity of income tends to discourage migration. The one good argument for Canadian protection is probably the one which has often been used rather cynically, and that is the conservation of natural resources. Given our inability to handle conservation problems at all neatly, since they involve uncertainties about future technological possibilities and, like other types of saving, intergeneration comparisons of utility, it is doubtful if anything useful can be said about this proposition, although it may have more validity than more popular arguments.

If a revenue tariff might have been less injurious than protection, clearly continental free trade offered even more favorable prospects. Professor Dales has shown that Ontario and Quebec—the two provinces which are said to have benefited from the tariff—have the locational attributes of industrial regions, and if there could have been a measure of certainty on the continuance of some form of commercial union, it appears not unlikely that there would have been a considerable movement of American industry to these areas. Under these circumstances, we might have had Professor Seymour Harris scolding Canadians instead of Southerners for attracting industry by unfair means and books might have been written entitled, "Why Industry Moves North." As things turned out, a view gradually developed that the economic links forged by the tariff were necessary if a measure of political unity and independence were to be achieved. It is true that this view was less popular in the Maritimes and the Western provinces than in the provinces which thought they had benefited from the tariff; but there was a sense in which the national policy lived up to its name.

The consequences of the Canadian tariff can be observed in Canadian

manufacturing today. There are a number of protected manufacturing industries which although paying a level of wages 15-20 per cent lower than that prevailing in the United States appear to be unable to quote competitive prices. Canadian manufactures in these industries have traditionally argued that apart from the fact that their materials, parts, etc., are subject to a tariff, the main reason for their relatively high costs is that they are producing for a market one-tenth to one-fifteenth the size of the American market. I have been attempting to test this proposition through the use of data on labor productivity in different types of Canadian industry and by gathering information from American and Canadian manufacturing firms carrying on operations in both countries. While I am not yet in a position to reach any firm conclusion, the results achieved so far give some support to this point of view. This is of some interest to economists in both countries, since it tells us something about the importance to the American economy of the size of the American market. The late Professor Allyn Young, in his famous *Economic Journal* article on "Increasing Returns and Economic Progress," suggested that "in certain industries, although by no means in all, production methods are economical and profitable in America which would not be profitable elsewhere. The importance of coal and iron and other natural resources needs no comment. Taking a country's economic endowment as given, however, the most important single factor in determining the effectiveness of its industry appears to be the size of the market." In comparing Canadian-American industry, I have found some evidence which would suggest that at least the first part of Young's observation is quite valid. American firms with American management and what in many cases is in effect the equivalent of an American working force, producing for a market which in many cases has American tastes, find that highly mechanized production methods which are economical and profitable in America are not profitable in Canada. There is one disturbing factor which may weaken this evidence. The level of wages is lower in Canada and sometimes, because of the tariff, the cost of machinery is higher. What about the possibility that substitution has an important effect? As everyone knows, marginalism never comes off very well in crude empirical studies. Here and there one finds a businessman who has either remembered something from his introductory courses in economics, or pays more attention to relative factor prices than his fellows, or has more possibility of substitution in his industry (in the language of activity analysis has a greater choice of activities) and he will report that relative factor prices have influenced his decision. But they are few and far between, and while I would be prepared to agree with those who argue that more substitution goes on

than reaches the consciousness of businessmen, if almost all one hears by way of explanation of different technology involves the scale of the market, this begins to carry some weight.

Bearing in mind the fact that limitations on the scale of the market facing many manufacturing industries in Canada are not natural phenomenon but rather the consequence of Canadian and American tariff policies, it would be interesting to know how important this factor is in lowering per capita income in Canada. I do not know the answer and I do not expect to know the answer with any precision, although I think something useful can be accomplished by further work on this question. It may turn out to be of considerable importance, although it must be remembered that the scale of the market is only of prime importance in manufacturing, and that in spite of the implicit assumption which seems to be made in many discussions of economic questions there are a few people employed outside manufacturing. In Canada in the postwar years around one-quarter of the labor force has been employed in manufacturing and a somewhat higher fraction of national income has originated in that sector. Since a portion of Canadian manufacturing is producing for the North American or world market while another portion is relatively unaffected by the limited size of the Canadian market, we are talking about a piece of the economy which is only a fraction of a fraction. As a result, the impact will be considerably lessened when measured against the economy as a whole.

I have concentrated on the transportation and tariff policies of the Dominion government, not because I think that these are the only factors in establishing and maintaining an income differential, nor even the most important ones, but simply because there is a limit to what can be said in one short paper. There are a number of other issues which might have been discussed. Differences in sectors of the economy outside manufacturing and transportation may give important clues in unraveling the puzzle. The part played by population also raises a number of interesting questions, which have come in for considerable discussion in recent years but on which the last word has not yet been said. Finally, there is that fascinating generalization that Canadians are in some sense less enthusiastic in their pursuit of economic ends than their neighbors—a proposition which is not easily testable but which may yet be attacked by an orderly collection of evidence.

We have seen that in at least two respects the policies followed by the Canadian people have had the effect of interfering with the free play of what might be called the natural economic forces, and it has been argued that this interference has had the effect of lowering per capita income in Canada. This does not mean that if viewed in a framework broader than that provided by economics, these policies were, and are,

wrong. The idea of a country extending from sea to sea which would have an independent existence and not be simply a northern extension of the United States came to be widely accepted as a worth-while goal in Canada, and it is often argued that these policies have made an important contribution to this goal. The result has been an experiment which is unique. A string of communities, stretching in a broken ribbon across a continent and in the case of two-thirds of the population with no language barrier separating them from nearby communities across the border, has developed into a national entity with a life of its own. This process has involved certain economic costs, but there is every reason to suppose that those who launched this experiment would not be displeased with the results which have been achieved.

ANGLO-AMERICAN PRODUCTIVITY DIFFERENCES: THEIR MAGNITUDE AND SOME CAUSES

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Differences between underdeveloped and industrialized countries in labor productivity usually are so marked that one can take their existence for granted. When, however, the contrast is between two industrialized countries, such differences are less obvious and, for any particular industry, often uncertain as to direction. Here statistical measurement serves as a useful prelude to any discussion of causes. The size and pattern of differences, together with additional information emerging as a by-product of the measurement process, are themselves indicative of the paths which explanatory hypotheses might take. Thus, though this paper is given in the main to a discussion of certain hypotheses commonly advanced in explanation of Anglo-American productivity differences and also to suggestions regarding a few others, its first section presents some statistical comparisons for the two countries and describes briefly the methods employed and the limitations of the findings.

I. *Productivity in Thirty Industries*

The table below, based on the United States *Census of Manufactures* for 1947 and the United Kingdom *Census of Production* for 1948, compares British with American labor productivity for thirty industries. The comparison is made in terms of ratios of physical output per worker and physical output per man-hour in the US to the same measures in Britain. Ratios also are given comparing size of market and size of plant. Collectively, the industries represent about 13 per cent of value-added in US manufacturing and 16 per cent of that in British (GB) manufacturing. Their selection was based solely on the amenability of census data to the purpose at hand. Product homogeneity and product classification in census reporting were principal considerations.

A variety of difficulties attend any statistical endeavor to measure industrial productivity, and the difficulties are compounded in the case of international comparisons. Both US and GB censuses pose obstacles

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TABLE 1

PRODUCTIVITY IN THIRTY BRITISH AND AMERICAN MANUFACTURING INDUSTRIES*

Industry	Physical Output per Worker† US/GB Ratio	Physical Output per Man-hour‡ US/GB Ratio	Size of Market (Physical Output) US/GB Ratio	Size of Establishment	
				By Number Employees US/GB Ratio	By Output US/GB Ratio
Tin containers	4.96	4.97	9.49	1.04	5.43
Cardboard containers	4.20	4.24	11.75	.94	*4.59*
Pig iron	4.17	4.91	5.78	.80	3.42
Wool yarn	*4.03*§	*4.53*	2.52	*1.27*	*4.85*
Radio receiving tubes	*3.30*	*3.74*	11.55	*1.06*	*5.58*
Cigarettes	3.25	3.63	3.80	2.77	16.96
Wool carpets and rugs	*3.15*	*3.28*	5.76	*2.01*	*6.04*
Glass containers	2.87	3.06	5.73	1.58	4.67
Soap	*2.81*	*2.89*	4.29	1.02	*2.45*
Paper sacks	2.71	2.77	10.61	1.81	5.05
Matches	2.48	2.59	5.53	2.86	7.06
Ice cream	*2.11*	*2.14*	28.24	*.73*	*1.43*
Animal feeds	2.11	2.06	9.75	.60	1.28
Biscuits	2.04	2.18	3.29	.76	1.72
Malt liquors	1.98	1.98	2.13	1.53	2.40
Grain milling	*1.94*	*1.86*	2.59	.82	1.64
Bicycles	*1.80*	*1.88*	1.37	—	—
Rubber tires	*1.76*	*2.03*	6.98	*1.39*	*2.64*
Jute yarn	*1.60*	*1.77*	—	—	—
Sugar					
US Cane, GB Beet	*1.66*	*1.82*	2.03	1.96	*4.05*
US Beet, GB Beet	*.77*	*.85*	.67	.51	*.46*
Building bricks	1.66	1.77	1.35	.95	1.48
Paint brushes	*1.63*	*1.74*	*2.65*	—	—
Cotton piece goods	1.62	1.78	6.32	4.56	7.64
Boots and shoes	1.51	1.67	4.30	1.42	2.96
Rope and twine	*1.51*	*1.61*	*2.28*	*1.48*	*1.94*
Margarine	1.21	1.23	.81	.52	.66
Cement	1.15	1.39	3.72	.99	1.06
Razor blades	*1.09*	*1.12*	2.80	—	—
Cured fish	.95	1.20	.30	1.08	1.07
Manufactured ice	.75	.69	41.27	.59	.46

* For the US, the figures relate to establishments employing ten or more persons For Great Britain they cover establishments employing eleven or more persons

† The term "worker" includes all employees—production workers (operatives) plus administrative, technical, and clerical workers.

‡ "Man-hours" refer to the man-hours of all employees, not just production workers (operatives) To obtain man hours on this basis, adjustments to the data additional to those made in the computation of output per worker are required. These adjustments are necessarily somewhat arbitrary and subject the output per man-hour figures to a slightly greater margin of error than applies to the output per worker figures.

§ All figures are rough approximations. Because of methods of census classification and reporting, certain figures are subject to a larger margin of error than others. Such figures are italicized.

SOURCES: The figures are derived from data in the U.S. Department of Commerce, *Census of Manufacturers: 1947*, Volumes I and II (Washington: U.S. Government Printing Office, 1949), the Board of Trade, *Final Report on the Census of Production for 1948*, selected volumes (London: HMSO, 1951, 1952, and 1953), and the *Ministry of Labour Gazette*, Volumes LVI, No. 10, LVII, No. 3 (London: HMSO, 1948 and 1949).

to the computation of matching product and employment categories. Both permit but imperfect determination of man-hours worked. Both leave unanswered many questions with respect to product classification and definition; in no instance, not excepting pig iron, brick, and cement, is the product truly homogeneous; yet without the knowledge of specialists one cannot be certain how the findings are thereby affected.

Comparative treatment of the two censuses gives rise to two further problems of major importance for physical productivity ratios. One of these concerns the lack of comparability in product structures between the two countries. Within many product complexes, for example, the British produce subproducts in different proportions from the Americans. This circumstance, together with lack of a uniform terminology and differences in methods of product classification, renders impossible in most instances a comparison of identical products. The most to be hoped for is a "reasonable" similarity in the things being compared. What is meant by reasonable is, of course, an open question. Even were it possible, it would not necessarily be best always to delimit the comparison to identical products or to adjust the data to eliminate the influences of product variety. For certain industries, differences between the two countries in the kinds and degrees of differentiation of both intermediate and end products have a good deal to do with differences in production methods and per worker output levels. In assessing the significance of this factor, one has need of productivity figures that reflect its effects.

The second problem relates to differences between the two countries in the degree to which various of the industries are vertically integrated. It relates also to differences in methods of reporting by the censuses. In the US, for example, establishments brewing beer also bottle it while in Britain bottling is done by establishments classified to a separate industry. Thus though both censuses report output in numbers of barrels, US output is subjected to additional processing which the figures do not reflect. In this instance a corrective adjustment is possible, but for most industries, it is by no means clear from the censuses whether significant differences in the degree of integration or in the methods of census reporting exist. Even where the nature of any difference is known, adjustment for it may be quite impractical. The virtues of physical productivity ratios—their seeming comparison of like with like and their freedom from the influence of fluctuating prices—are lessened by problems such as these.

Because of occasional variations in methods of reporting and details given by the censuses of both countries, complete uniformity from product to product in computational procedure was not possible. For

Britain, customary procedure, in barest outline, was to begin with sales figures together with corresponding physical quantities for a given product and then to adjust them for that fraction of sales made by establishments classified to other trades and for inventory changes during the year. A matching employment figure was then obtained by adjustments, where necessary, based on the value of output figure. Information on man-hours worked, drawn from the *Ministry of Labor Gazette,* supplemented the employment figures. For the US it was usually necessary to begin with total shipments of a product, and then to adjust the figures for shipments by establishments classified to other trades and for inventory changes during the year. The census gives total man-hours directly. (See footnote ‡ of the table on this point.) Adjustments to this figure to eliminate the influence upon it of production by an industry of certain secondary products yielded matching quantity and man-hour data.[3]

The statistical findings in the table represent at best a rough approximation of the facts. The limitations enumerated above—as well as the more commonly recognized ones attaching to all productivity comparisons, whether between countries or over time—must be kept in mind. Fortunately for what follows, we need not rely on the exactness of the figures.

Our physical productivity ratios range from a high of about five in the manufacture of tin containers to a low of about seven-tenths in the manufacture of ice. From among all of the ratios, only this latter one and those for beet sugar and cured fish (output per worker only) show an advantage for Britain. No obvious explanation of the ranking of the ratios suggests itself. Several industries employing comparatively roundabout and highly automatic methods possess high ones; e.g., cardboard containers, cigarettes, tin containers. At the other extreme, the ratios for cured fish, paint brushes, and bicycles—all relatively labor-intensive industries—rank fairly low. But the tendency is not clear cut. Rubber tires, boots and shoes, and margarine make use of highly indirect production methods, but the US/GB productivity ratios are not correspondingly high. More worthy of note is the fact that the US advantage, rather than being limited to any few products or production

[3] As noted in the text, a consideration in selecting industries for comparison was product homogeneity. For that reason it sometimes proved feasible in arriving at an output figure simply to aggregate the quantities given for the various subproducts of a product group An alternative procedure, employed in instances of more complex product structure, was to select a "typical" subproduct common to both countries and to adjust the other subproducts to a comparable quantity base through use of an implied price for the typical subproduct. Here the quantity of any subproduct is given by the formula $\Sigma v_i/p_A$ where v_i is the value of output of any subproduct and p_A the price of a unit of the typical subproduct. This procedure was used only in instances when the typical subproduct constituted a major fraction of the total value of the product complex.

methods, is more or less pervasive through technical processes and product types.

So large a margin as that which, on the average, favors the US cannot have developed over a few years or even over a decade or two. It must be the outcome of a lengthy process of differential economic change between the two countries. If the hypothesis is accepted that the relationship was reversed, with GB productivity the higher until perhaps the early part of the nineteenth century—in what degree remains quite uncertain—then the inception of Britain's relative disadvantage belongs back a hundred or more years.

Of interest are some comparisons of productivity for prewar years. As might be expected, they evidence a marked advantage for the US. Basing his calculations on census data for the 1935-39 period, Rostas found for some thirty-one manufacturing industries an average US/GB ratio of output per man-hour of 2.8. He found, further, that the US advantage was not confined to the manufacturing sector but extended with even greater force to mining, public utilities and communications, and transport while significant but less marked disparities prevailed in building and construction, distribution and services, and government.[3] Estimates utilizing supplementary materials confirm these conclusions. (See P. Barna, *Oxford Institute of Statistics Bulletin*, July, 1946.)

Comparisons for yet earlier periods support the impression yielded by those for later ones. Taussig has provided information on physical output per worker in 1907-09 for several industries.[4] His US/GB ratios are 2.2 for pig iron, 2.1 for steel, 2.9 for tinplate, 2.0 for cement, 1.7-2.0 for sugar refining, 1.5 for flour milling, and 1.2 for ice. Another set of data, based on money values and of considerably greater scope, are available for the same period.[5] Here the average of ratios for thirteen industry groups is 2.26. In light of the available statistics, there can be little doubt not only that US labor productivity greatly exceeds that of Britain but also that the US advantage extends back well into the last century. The sources drawn upon and methods of computation employed differed for each of the several sets of data referred to. For this reason no attempt should be made to compare them directly or to compute from them, for particular industries or economic sectors, rates of change in productivity differences over time.

[3] L. Rostas, *Comparative Productivity in British and American Industry* (Occasional Paper XIII, National Institute of Economic and Social Research, 1948), pp 27, 89

[4] F. W. Taussig, "Labor Costs in the United States Compared with Costs Elsewhere," *Quart. Jour. Econ.*, November, 1924, pp. 96-114. The data are based upon some unpublished figures of A. W. Flux and the 1907 and 1909 censuses for the UK and US, respectively.

[5] A. J. Flux, "Industrial Productivity in Britain and the United States," *Quart Jour. Econ.*, November, 1933. The author also has provided data for 1924-25.

II. *Explanatory Hypotheses*

International productivity comparisons sometimes are regarded as indicators of the relative effectiveness with which countries allocate and utilize their resources. At stake whenever they are so regarded is the particular definition of efficiency being used. Output per man or man-hour measurements ignore capital inputs which are equally with labor a real cost, albeit less easily measured. They ignore the fact that differing demand structures might require somewhat different types and qualities of product. They neglect the fact that differing resource conditions sometimes require different techniques of material handling and fabrication. It is conceivable, in some instances certain, that conditions in two countries so diverge as to call for quite different methods and organization of work. Where therefore one's concern is with the effectiveness with which resources are being used, what is needed are not man-hour output figures or even data covering direct and indirect expenses reduced to some unit of real cost. Ideally, what is needed is some notion of optimum resource use and the degree to which practice falls short of attaining it.

These considerations render improper use of the US/GB ratios as measures of the success or failure of either country in realizing economic utilization of its resources or in achieving best practice in its production methods. Nevertheless, it is well to remember that just as increases in productivity over time within a country signal reductions in real unit costs, though not necessarily in the same degree as productivity increases, so differences in productivity between countries generally indicate differences in real unit costs. A commonly espoused objective of economic policy is the continued increase over the years in productivity levels. Inquiries into the causes of US/GB differences may yield clues on how best to further this objective.

Resource Differences as a Cause of Productivity Differences. Resource conditions may affect productivity levels in a number of ways. An obvious direct effect is on the level of productivity in the extraction industries. Coal and iron ore are familiar examples. Supplies of these minerals are more accessible in the US than in Britain, permitting shallower mines and a larger proportion of opencast mining. These facts go far to explain the higher US/GB man-hour output ratios for iron ore and for coal. Resource conditions also act indirectly on productivity in mining by fixing limits to the degree and kind of mechanization permissible. Much modern cutting and conveying equipment is unsuited to British coal mines, where shafts are deep and seams thin.

The impact on the resource-using industries, exerting itself in many directions, may be equally great. American productivity in the manu-

facture of paper and paperboard containers and in the packaging process itself benefits considerably from abundant supplies of good quality paper and board.[6] Not only do the raw materials lend themselves to mechanized methods of processing more readily than do those imported by Britain, but their lower cost relative to labor and machinery costs conduces to employment of material-using, machinery-using laborsaving methods.[7] In steel-making, the much lower phosphorous content and somewhat lower sulphur content of the basic iron available to US plants aids their productivity,[8] while access of US steel foundries to cheap Bentonite and high quality silica sands facilitates their use of laborsaving techniques.[9] Again, US productivity in the manufacture of shoes benefits from the better quality of leather available here than in Britain.[10] Where the raw material is a fuel, its scarcity and consequent high price is likely to restrict the development and application of various kinds of power equipment. Absence of petroleum and natural gas deposits in Britain doubtless has something to do with the extent and quality of mechanization in its industries.

One of the commonest theories accounting for America's comparatively high productivity relates to the indirect effects of the country's abundant land supply. Opportunities on the land and at the frontier during the last century, it is said, reduced the supply of labor available in industrial areas. Resulting factor price ratios conduced to mechanization which, it is claimed, is the principal determinant of labor productivity. The conventionally assumed relationship between land supply, wage rates, and intensive mechanization is not contested here. Whether mechanization is the primary factor accounting for high productivity in the US is discussed in a separate section below.

It is worth noting that some of the handicaps faced by Britain in

[6] Anglo-American Council on Productivity, *Packaging* (London and New York, 1950), pp. 23-24. (Reports by this organization which are the outcome of visits to the US by British teams of specialists will henceforth be designated Productivity Reports.) The report states: "The U.S not only is a producer of basic paper and board fibres, but converts them into finished materials of outstanding quality These fine materials are the foundation of the ultimate packages and of the mechanical packaging process This relationship cannot be ignored." It notes that in the US conversion industries, "slow running, stoppages and excessive spoiling due to faulty materials are rare, while in the packaging industries higher output can be obtained . . . because of the higher degree of rigidity and consistency in the material and a consequent greater structural strength."

[7] *Loc. cit.* Resource shortages may be "induced" as well as "natural." Rostas, *op cit.*, p. 203, refers to the heavy duty on raw tobacco in Britain In face of the resulting high price, the industry, to minimize the wastage of leaf, strips a sizable proportion of it by hand and operates its stripping machines at comparatively low speeds.

[8] British Iron and Steel Federation, *The Iron and Steel Productivity Report*, p. 6. This document summarizes the productivity report published by the Anglo-American Council on Productivity.

[9] Productivity Report, *Steel Founding* (1950), p. 34.

[10] ". . . the outside cutter, applying the die to a clear surface skin, finds it necessary to spend less time moving his pattern, selecting the appropriate quality of the surface and feeling the skin for texture, weight or quality." Productivity Report, *Footwear* (1951).

the way of raw material shortages or materials of inferior quality are not attributable directly to natural conditions but are in part the outcome of British industrial and technological practice. Thus, in fabrication of tin containers, British producers must rely on the hot mill plate in general use in their country while US producers benefit in terms of cost and productivity from abundant supplies of technically superior cold-reduced tinplate. "The saving in cost is not just in the material itself but in the higher production speeds which can be attained with a consistent raw material having the appropriate qualities." (*Packaging, op. cit.*, page 19.) Similarly, the machinability of steels and cast iron used for machine tools in Britain generally is inferior to those used in the US,[11] and the surfaces of metal products often are poorer and require more finishing.[12] Instances like these tell us something about methods in the industries consuming intermediate products but little about conditions in the industries supplying those products. To assess fully the influence of resources on productivity, conditions in both groups of industries must be considered.

From the evidence it is fairly clear that resource differences contribute in many instances to productivity differences. However, resource differences seem not to suffice as a general explanation of productivity differences. As noted earlier, the US advantage is not confined to any special group of industries. It pervades the new as well as the old, the highly mechanized and standardized as well as the less technically developed, and those producing consumers' as well as producers' and durable as well as nondurable goods. The differences are not limited to the manufacturing sector, but appear to extend to others. Hence it cannot be said that they relate only to those products or processes that might be exceptionally affected by resource or similar endowment factors. It must also be remembered that technological and product requirements fix limits—occasionally narrow ones—within which modern industrial communities must work, and to this extent the scope for intrusion of the resource element as a factor affecting productivity is reduced. To the same extent, productivity differences will reflect the impact of other factors. In many instances, moreover, raw material costs are but a minor element in total fabrication costs.

Equipment Differences as a Cause of Productivity Differences. The one element which is held more frequently than any other to be mainly responsible for high productivity in the US is the extensive use of capital equipment. Indeed, high productivity and the employment of

[11] Productivity Report, *Metalworking Machine Tools* (1953), pp. 1-2.
[12] Productivity Report, *Metal Finishing* (1951). "The excellent surface condition of the metal available in the U S. . . . may be the most important factor in the comparison of American and British (polishing) practice, since this condition controls the number of stages of polishing and the effort required at each stage" (pp. 21-22). See also p. 12.

large amounts of machinery are usually regarded as inseparable. Almost without exception, the recently published Anglo-American Productivity Reports comment on the greater aid received from machines by the American worker than his British counterpart. Writing half a century earlier, the Mosely Industrial Commission (a team comprised largely of British trade-union representatives) emphasized the same point.[13] Still earlier, in the 1850's, members of another British group stressed the tendency of American manufacturers to adopt machinery wherever possible and took cognizance of its effect in many industries. In the view of one of these observers, America's pace of industrial development was attributable to "the universal application of machinery effected with a rapidity that is altogether unprecedented."[14] Without doubt, equipment differences comprise a large part of the explanation of observed productivity differences. For the present discussion, however, the relevant question is whether equipment differences, by systematically accounting for US/GB productivity differences in a range of industries, suffice as a general explanation of the latter.

For want of suitable data, the question is difficult to test. To the writer's knowledge, estimates of the quantity of capital employed industry by industry for both countries are not available. Horsepower figures provide a crude substitute measure. Such figures are not given in the 1947-48 censuses, but Rostas has taken them from censuses for earlier years.[15] His findings show for the manufacturing sector as a whole that the horsepower per worker ratio for the two countries is about 2 to 1. (These horsepower figures, along with Rostas' productivity figures, may also be used to throw some light on the question of whether equipment costs offset the laborsaving advantage possessed by the US. Since, for the manufacturing sector as a whole, the US/GB ratios of output per worker and horsepower per worker are both about 2 to 1, horsepower per unit of output is about the same for both countries. Insofar as horsepower is a measure of capital cost, it follows that lower unit labor costs are achieved in the US without any increase over Britain in unit capital costs. US productivity defined as 1/unit labor cost plus unit capital cost, while somewhat less than twice as high as UK productivity, is still substantially higher than the latter.) This 2 to

[13] Mosely Industrial Commission to the United States of America, *Reports of the Delegates* (Manchester: 1903). See, e.g., pp. 6, 8, 14, 110, 150, 216.

[14] *New York Industrial Exhibition: Special Report of Mr. Joseph Whitworth,* British Sessional Papers, House of Commons, 1854, XXXVI, p. 5. Observations on the unusually extensive application of machinery are found frequently both in this report and the companion report by Wallis (*Special Report of Mr. George Wallis*). See also D. L. Burn, "The Genesis of American Engineering Competition 1850-1870," *Economic History,* Vol. II, pp. 292-311.

[15] Rostas, *op. cit.*, pp. 52-54, 68-70. He gives figures for the UK for 1930 and for the US for 1929 and 1939. The UK figures are for horsepower in use and the US figures for horsepower installed.

1 ratio approximates that which he obtained for output per worker, suggesting a relationship between productivity and equipment used. But when the situation is examined industry by industry, the most one may say is that in the US productivity is greater by varying amounts and so is horsepower, with little systematic relationship between the two. US industries enjoying relatively large productivity advantages over corresponding GB industries are not regularly aided by amounts of horsepower proportionately above the average, and those with smaller productivity advantages do not always use horsepower in amounts proportionately below the average.

Unfortunately, no simple quantity index of equipment used will adequately measure its effects. Equipment differences are of a qualitative as well as a quantitative kind. Machines need not be more costly or of greater power to perform better. The very essence of an innovation is the qualitative change in technique it entails. Moreover, equipment differences usually carry with them ancillary differences—in plant layout, material flows, labor skills, and the like. In short, equipment differences reflect themselves in many dimensions other than the quantity of capital dimension. In practice there is no easy way of deciding which of these ancillary differences or what part of any one of them to associate with equipment differences, nor is there any easy way of measuring their importance. This is not to say that the relationship between productivity differences and equipment differences must be greater than the horsepower figures indicate. But these considerations suggest that it probably is more fruitful to regard differences in the quantity of capital employed as but one of several factors contributing to productivity differences rather than to seek for or expect any simple relationship between the two.

The Market-size Hypothesis. The theory that the productivity level is related to market size is a corollary of that which ties the productivity level to the quantity of capital employed. Modern methods are founded, by and large, upon the use of machinery and equipment in fairly large blocks. In face of the resulting indivisibilities and the need for a high degree of specialization in the application of mechanical and human effort, small markets constitute a handicap. Relatively large markets make for reduced costs and high productivity by facilitating an optimum division of function within the plant, within the industry, and throughout the economy. Upon this generally recognized fact are founded most of the observations which attribute Britain's low productivity to the nature of its markets. These, it is said, are too small to allow for both sufficient variety of product and at the same time its output on a basis permitting the economies of standardized mass processing.

In all but three instances—cured fish, beet sugar, and margarine—our data indicate that the US market, as measured by national output, is larger than the British market. In several instances—like paper bags, radio receiving tubes, cardboard containers—it is more than tenfold larger. But there exists no regular relationship between differences in market size and differences in productivity. Given differences in productivity sometimes are associated with much larger differences in market size, as with animal feeds and boots and shoes. At other times given differences in productivity are associated with much smaller differences in market size, as with cigarettes and wool yarn. With few exceptions, the inclusion of small establishments—those with ten or fewer employees in Britain and nine or fewer in the US—would have little effect on the ratios for size of market given in the table. For jute yarn, cured fish, and manufactured ice the ratios would be reduced somewhat. Rostas (*op. cit.*, p. 59), analyzing his data for the thirties, found some interrelationship in that for several industries where the US productivity advantage was greatest the US market was comparatively quite large. Otherwise he found no close relationship. If the data are adjusted by eliminating those industries whose markets tend to be narrowly regional or local rather than national, a moderate relationship between the two variables is observable. But then the task arises of ascertaining the sequence of cause and effect. Are large markets responsible for high productivity and the low real costs usually accompanying it? Or is it that large markets follow upon the prior establishment of high productivity and low costs? The mere coincidence of large markets and high productivity would not answer these questions.

Unless one assumes what it does not appear valid to assume—that productivity levels vary directly and continuously with market size and that the highest productivity levels are associated with the biggest possible size of market—then 50 or 60 million potential consumers should offer as great or almost as great an opportunity for gains from specialization and mass production as 150 or 160 million. Probably all industries are capable of exhausting potential economies within notably smaller confines. Britain's population, moreover, occupies an area but fractionally as large as that of the US. As a result, its industry confronts a market unbroken by the vast transport distances which make for spatial differentiation and hence for smaller effective market size. Thus market size, properly qualified, far from exerting a differential adverse effect on British industry, may constitute a positive advantage to it. E. Rothbarth ("Causes of the Superior Efficiency of U.S.A. Industry as Compared with British Industry," *Economic Journal*, Septem-

ber, 1946, page 384) notes that in 1870 the US market as a whole was probably smaller than the UK market as a whole, while the population of the latter was much more compact and accessible. Yet it appears that US productivity in some industries was even then significantly greater.

Effective market size involves much more, of course, than the sheer number of potential consumers. A fact often referred to is the importance of foreign markets in Britain's demand structure. These, it is said, vary in their nature from one importing country to another, imposing upon the British producer heterogeneous requirements with respect to type and quality, so that economizing long runs of standardized products become impossible. The data confirm that for several of the industries treated in this paper, a fairly large percentage of total output is for export. Of the thirty product groups in the table, British exports as a percentage of production in 1948 exceeded 25 per cent for seven of them. The approximate figures are: bicycles, 69 per cent; razor blades, 46 per cent; fish curing, 41 per cent; wool carpets and rugs, 37 per cent; cotton piece goods, 36 per cent; rubber tires, 32 per cent; sugar, 25 per cent. But even assuming a marked divergence in product requirements between the domestic and the foreign market, the possibility appears for only a few of these that the balance left to the home market is so small as to preclude the use by the bulk of industry of high labor productivity methods. There is no obvious reason—at least to this writer—why the special fabrication techniques that may be suited to export production need set the pace for the economy.

If there be any useful hints in the market hypothesis, they relate not to market size per se nor to export markets but to both the structure of the industry and the structure of the market as these have developed in relation to one another. Where markets for a given product-class are large but highly differentiated, product specialization by firms to a degree compatible with use of highly laborsaving methods may prove impossible. This difficulty is relevant, not only to markets for final products, but equally to intermediate producers' markets. If the demand for semiprocessed raw materials, for components, or for machines is structured and variegated rather than reasonably standardized, the suppliers of these items will experience the same handicaps as will suppliers of finished consumers' goods.

Evidence suggests that in Britain, over a wide range of industries, success in standardization and simplification (the two terms, while sometimes finely distinguished from each other, are here used interchangeably) has been markedly less than in the US. It is uncertain when divergence between the two countries became pronounced. But again differences, as reflected in the degrees to which specialization is carried

out within and among plants, are observable as far back as the middle of the nineteenth century. Especially pertinent are the views expressed by a British group in the early 1850's. It took particular note of the adoption over much of American industry of the "manufacturing principle," according special mention to locks, clocks, small arms, and many branches of the woodworking trade. In the manufacture of locks, for example, it was noted that "all the locks of each description produced are identical, and their parts can be interchanged,"[16] and in woodworking, attention was called to the division of work "into special manufactures where only one kind of article is produced, but in numbers . . . almost in many cases incredible."[17] The British commented on these features of American production because they contrasted with those typical of their own country.

Comments in later years ran in a similar vein. Writing during the first World War, the Board of Trade Engineering Trades Committee called attention to the multiplicity of products produced in each establishment, to the pride many of them took in this state of affairs, and to the confusion and diseconomies that resulted. It compared the situation to that in the US (and Germany) where variety in each plant was limited, and concluded that future progress in the British engineering trades was contingent upon greater standardization and output on a larger scale. (Committee on Industry and Trade, Part IV, *Survey of the Metal Industries* [London: HMSO, 1928], page 146.) The testimony presented during hearings before the Balfour Committee, in the latter part of the twenties, confirmed the need for greater standardization. It indicated also that differentiation was not merely tolerated but in many instances was actively encouraged. (*Ibid.*, page 162, for examples in agricultural machinery and jute.) Suggestions that simplification and standardization policies ought to be pursued often were met with expressions of apprehension that such policies would endanger quality or lose markets through customer dissatisfaction or fix a pattern which time and change would make obsolescent.[18]

Emphasis upon the advantages accruing from standardization and its greater ubiquity in the US than Britain comes also from more recent inquiries. Many of the Anglo-American Productivity Reports stress

[16] *Report of the Committee on the Machinery of the United States of America* (hereafter referred to as the Machinery Report), Sessional Papers, House of Commons, Vol. L, 1854-55, p. 12.

[17] *Ibid.*, p. 64 Observations of the kind cited in the text are found frequently in this report.

[18] *Survey of the Metal Industries, op cit*, pp. 162, 221, 227-228. In connection with bicycles, industry representatives questioned the desirability of a standardized, mass-produced article on grounds that "popular taste would not favor a very cheap bicycle" (pp. 227-228).

this issue. Limitation of variety is strategic because it intertwines with a complex of other factors affecting the productivity level. Its relationship to the use of automatic machinery was mentioned. Such machinery tends to be highly specialized in purpose and hence advantageous only where the identical operation must be repeated many times over. Long runs of uniform products permit this repetition; output in small batches of varied products usually does not. Besides facilitating the use of machinery with its resultant saving in direct labor, product uniformity also saves skills, as machine-tending and the performance of fairly rudimentary tasks replace the craftsmanship of the artisan. It permits more systematic plant layout and workshop organization, so paving the way for continuous processing methods and yet greater division of labor. It eases problems of material handling and warehousing. The interchangeability of parts it entails contributes to reductions in servicing and replacement costs and in the size of inventories. Contrary to popular opinion, product uniformity also may mean better product quality. Constant technical advance has brought improvements in the quality of mass-produced items and worked to diminish quality differences between them and similar items produced by less roundabout methods. Precision methods and quality control—integral features of the newer techniques—have furthered this end. For illustrations, one may look to the auto and textile fields. The distinction between quality goods and standardized goods, always in favor of the former, is no longer so generally acceptable insofar as it relates to the functional characteristics of those goods.

It is not intended here to grant any causal priority to differentiation or lack of it as it relates to other factors affecting productivity. It is not to say, that is, that use in the US of more equipment and less skilled labor results from standardization and simplification. On the contrary, it is plausible that a scarcity of labor, notably skilled labor, in the formative years of this country's industrialization led to mechanization which brought with it, from necessity, a high degree of standardization as well as other features. In the judgment of Wallis (*op. cit.*, pages 2-3), the invention of laborsaving machines, "whose automatic action so completely supplies the place of the more abundant hand labor of older manufacturing countries," was stimulated in the US by the difficulty of securing skilled and disciplined labor. Other hypotheses may well be equally or more plausible. But it seems fairly clear that standardization is closely tied in with other factors bearing on productivity levels and that its presence or absence is associated with the presence or absence of these other factors.

The Effects of Plant Size on Productivity. The question of how plant

size relates to efficiency has been much discussed and investigated. The same question may be raised here, provided we substitute "labor productivity" for "efficiency." The rationale for expecting plant size and productivity to move upwards together is not unlike that for expecting market size and productivity to move upwards together. Opportunities for the application of machines, for specialization, and the division of labor increase as the plant becomes larger, just as they increase, at least up to a point, as the market becomes larger. In the latter case the economies attainable are of both the internal and external kinds while in the former they are mainly internal to the plant.

If the plant size-productivity hypothesis is useful in the present case, then we would hope to discover that US plants are, on the average, larger than British plants and possibly also that the amounts by which they are larger from one industry to another vary with the amounts by which US productivity is greater from one industry to another. The effort to test this hypothesis brings forth a fundamental difficulty: Should plant size be measured by output or by employment? If it is measured by output, then, as with the market-size hypothesis, what cause-and-effect sequence does one impute to a positive finding? Is the productivity of US plants higher because their output is higher, or is their higher output a consequence of the lower costs (or higher incomes) associated with higher productivity? Or is there a mutual interaction between the two variables?[10] Moreover, the output measure neglects the influence of vertical integration which can result in an increase in size (in one sense) without affecting output. If in any industry the plants in one country subcontract much of the work while in another country the plants perform most of the tasks themselves, this difference will not be reflected in an output measure. The 1949 Productivity Report, *Simplification in Industry* (page 8), calls attention to a stronger tendency in the US than Britain toward subcontracting and expresses the view that it aids productivity by making for greater specialization. It also may bias our productivity figures since it reduces the likelihood that a given product classification in the respective censuses will cover the same range of processes.

If employment is used to measure size, these handicaps are bypassed to a certain extent. Differences in both vertical and horizontal integration will generally be reflected in employment differences. The problem of causal sequence will be less serious since, while high productivity,

[10] One might argue that in the US resource conditions, factor-price ratios, and demand conditions favor the construction of large plants (high output plants) and that large plants facilitate high productivity. Or one might take the view that unique managerial talents, cheap resources, or some other circumstance result in high productivity which in turn leads to large plants to meet a large sales demand. There probably is merit in both approaches.

insofar as it implies low costs, will tend always to result in high output, it may conduce to low as well as to high employment. This follows because though high productivity brings high output, thus tending to increase employment, it also brings reduced labor requirements per unit of output, thus tending to reduce employment. Unfortunately, these two offsetting tendencies deprive us of easy criteria for evaluating our statistical findings. Plants are built with the primary object of accommodating a certain output or range of outputs, not a given size labor force. Should we, then, expect employment to be high where productivity is high? Or should we expect it to be low? The answer turns on the elasticity of demand, which is known to vary substantially among industries.

The foregoing qualifications would make difficult interpretation of most data on plant size and productivity, whatever those data showed. If the qualifications are less troublesome for the present study, it is only because the data support no obvious hypothesis. If size of plant is measured by number of workers, then average size of plant is found to be larger in the US in sixteen industries and larger in Britain in eleven industries. In a few instances—biscuits, animal feeds, ice cream, manufactured ice—British plants are considerably larger than those in the US. In a few other instances—cigarettes, cotton piece goods, matches—the picture is reversed, with US plants being two to three times as large. But the data do not sustain any generalization for the whole of industry. The picture does not change when differences between the two countries in plant size are related to differences in productivity. US productivity is usually higher where plant size is smaller. Where US plant size is larger, the degree to which it is larger evidences little relationship to productivity.

Measuring plant size by output, British plants prove to be larger for margarine, beet sugar, and manufactured ice. US plants are considerably larger for cotton piece goods, glass containers, cigarettes, matches, paper bags, radio receiving tubes, tin containers, and wool carpets and rugs. For all the industries, British plants are larger in three cases and US plants in twenty-four cases. While in a few instances—glass containers, tin containers, cigarettes, radio receiving tubes—large differences in plant size coincide with large differences in productivity, no definite judgments on this score seem warranted.

III. *Some Other Factors*

Many factors, in addition to those cited above, affect productivity levels. Only three others—managerial and union attitudes and structures, workshop organization and control, and specialization of labor—will be taken up here. Their effects on productivity are less tangible

and less measurable than the ones already discussed. Perhaps for this reason they rarely are accorded the status of general hypotheses in explanations of Anglo-American productivity differences. Yet their influence appears to be great, particularly so where their interactions with one another or with the resource, equipment, and market factors are considered.

Differences between the two countries in management's approach to production problems and in worker attitudes and practices have been a subject of comment by both early and contemporary observers. The comments differ in detail. But the impressions conveyed by these observers, whether they wrote five, fifty, or a hundred years ago, are in rough agreement on a number of points.[20] Management in the US is less bound by traditional techniques; it responds more readily to new ideas and is prepared to implement them more quickly than its British counterpart. It is more attentive to and seeks more thoroughly to control costs; relatedly, it is more output- and productivity-conscious than is British management. It is comprised to a greater extent of men who have received technical and engineering training and it makes greater use of highly trained specialists of all sorts in filling its advisory and supervisory needs. It is less centralized in its control, is less hesitant to delegate responsibility, and provides at all levels greater opportunity for advancement to those with ability and initiative. Not least, it is more functional and utilitarian in its approach to product design and finish, emphasizing service for the job rather than appearance or quality that is beyond requirements. On the labor side, US workers resist technical changes less than do British workers and accept time-study and job reclassification more readily than do the latter. Less extensive and less rigid craft demarcations also ease the introduction of organizational and technical changes, and a more simplified wage structure contributes to the same end. These same circumstances give management greater latitude generally in administering operations and in adjusting to shifts in demand and supply and so aid accordingly in attainment of higher productivity levels.

Conditions relating to work shop organization and production control seem also to favor the US and to have favored it for a long time. Observers in the last century made reference to the "almost perfect system of manufacture" found in many American trades[21] and to the

[20] These remarks are in the nature of broad impressions conveyed by the literature cited elsewhere in this paper: the Productivity Reports, the Balfour Report, the Mosely Report, the reports of Wallis and Whitworth, and the Machinery Report.

[21] ". . . a considerable number of different trades are carried on in the same way as the cotton manufacture of England, viz., in large factories, with machinery applied to every process, the extreme subdivision of labor and all reduced to an almost perfect system of manufacture." Machinery Report, *op. cit.*, p. 32.

greater attention paid to all details by American manufacturers.[22] The more recent Anglo-American Productivity Reports, in contrasting British and American conditions, refer to good production planning in the US which avoids waste of man and machine hours,[23] to smoothness and continuity in the work flow, to the "excellence of the organization which provides (workers) with . . . the parts and materials they require at the right places at the right times,"[24] to plant layouts that minimize the need for handling and for intraprocess storage,[25] and to a timely and speedy analysis of information on operations that enables production control to operate with maximum effectiveness.[26] Observations of this type occur with such frequency and with reference to so many industries as to suggest applicability to a wide range of manufacturing activity.

Evidence of the greater extent to which the specialization factor has operated in the US is found in two areas. The first concerns the quality of skills among production workers in the two countries. This quality seems always to have differed, with US factories employing a smaller proportion than UK factories of craftsmen who have undergone lengthy apprenticeships. American reliance upon semiskilled and unskilled labor implies specialization of function, just as British reliance upon skilled labor implies its opposite. It is through the breakdown of complex tasks into a lengthy series of rudimentary ones that this country has been able to utilize a comparatively unskilled labor force so effectively. This type of specialization obviously is closely related to the degree of mechanization, since it is mechanization which greatly reduces skill requirements. The second area where labor specialization manifests itself is in administrative, consultative, and supervisory ranks. American industry employs production and design engineers, job-rating men, cost control experts, maintenance personnel and other specialists in larger proportions than British industry.[27] Such specialists are, on the whole, quite skilled. Their employment compensates for the lack of all-round, artisan-type skills available on the shop floor. It also is tied in with the degree of mechanization in that capital-intensive methods are dependent on such skills for their efficient functioning.

An assessment of the relative importance of these factors as against others like resources, equipment, and market structure is no easy task and will not be attempted here. With respect to all of them, however, at

[22] See the article, "American Manufacturing Methods," by a correspondent with the Mosely Commission in *The Times*, Dec. 26, 1902, p. 9-1.

[23] E.g., *Rigid Boxes and Cartons* (1951), p. 5.

[24] E.g., *Diesel Locomotives* (1950), pp. 2-3.

[25] E.g., *Packet Foods* (1951), p. 17.

[26] E.g., *Production Control* (1953), p. 12.

[27] See, e.g., *Diesel Locomotives*, p. 2; *Brushes*, p. 17; *Heavy Chemicals* (1953), p. 9.

least three things seem fairly certain: First, they are factors of consequence and merit a place in any explanatory framework. Second, they register their effects not in isolation but through complex interaction with each other. Third, none is of recent origin, but their roots go back at least to the middle of the nineteenth century. Their different impacts in the US than Britain are the outcome of rather basic differences between the two countries in the processes of economic development.

DISCUSSION

D. H. STEINTHORSON: Data concerning productivity in individual industries are valuable for their own sake, but Mr. Young and Mr. Frankel are interested in these data primarily for the light they throw on the larger problem: What determines the productivity of an economy? In the analysis of this problem, both authors make fruitful use of the comparative and historical approaches. My comments are restricted to Mr. Young's paper.

The productivity of an economy can be inferred from income (or expenditure) data, as well as estimated more directly from production data. Mr. Young's point of departure is a comparison of per capita income in the United States and Canada. Although income per capita reflects other factors in addition to productivity, I think it would be worth while to have estimates, however rough, of per capita income in the regional and industrial components underlying the national totals. These estimates would be useful background to the subsequent discussion and might help meet the objections of those skeptics who doubt whether the two economies are sufficiently similar to make comparisons of average income meaningful.

Having commented on the difference in income per head between the two countries, Young says that after making allowance for labor force participation ratios, the international investment position, and the industrial distribution of employment there remains "a hard core which appears to be of long standing." Allowing for labor force participation and the international investment position is necessary in moving from an income concept to a productivity concept, but I think it is illegitimate in this context to make an allowance for the industrial distribution of employment, since this is partly a product of the process of historical development which has been influenced by tariff policy and other factors the influence of which Young wants to estimate.

In comparing Canadian and American economic development, there are three ways in which we can make experimental reconstructions of history. One way is to ask how the economic development of North America would have worked out north of the Rio Grande had the formation of the Canadian nation in 1867 been followed fairly soon by something approaching economic union with the United States. This would have implied transcontinental railways south of the Great Lakes and free trade between the United States and Canada. In practice, free trade would have meant Canada's adopting the American tariff against other countries. These and other implications would have meant that economic union would have been tantamount to abandoning the idea of building a sovereign nation north of the United States.

The second way of reconstructing history is to ask a more restricted question. We may accept the decision to build a Canadian nation and ask what would have happened if different trade and transportation policies had been adopted. Canada might have had only one railway north of the Lakes (but one would be the minimum) and might have adopted a low tariff in the face of the high American tariff.

The third, and simplest, approach would accept the present situation for what it is and attempt to measure the economic burden borne by Canadians today on account of such avoidable and unavoidable overhead costs of nationhood as the railways across the Shield. This more modest level of abstraction offers less scope for imaginative thinking than do the others but it does have some immediate relevance to public policies affecting income distribution regionally and otherwise.

All three types of question are interesting and legitimate but we must be very careful to distinguish between them. Comments applicable to one type may not be applicable to the others.

Young hopes on some later occasion to say more about Canadian railway policy. For the moment, he reminds us of some familiar historical facts and refers to a tentative comparison of traffic output per worker on Canadian and American railways. To describe the contribution of railways to Canadian productivity one would need to know the productivity ratios for other inputs into railways and the traffic requirements per unit of output in other industries. But neither this information nor the financial data cited by the author would suffice to disentangle the consequences of duplication from the consequences of the geographical distribution of North American resources or the recent competition from other modes of transport. More detailed analysis would be required.

When he turns to tariff policy, Young addresses himself primarily to a question of the second type. He asks whether a low Canadian tariff in the face of a high American tariff would have affected Canadian economic development in such a way as to give Canadians a higher per capita income today than they now have. In suggesting that an appeal to international trade theory should settle the issue, Young is perhaps more optimistic than some others would be. The problem is not to find an optium allocation of resources in given circumstances but the even more tricky one of reconstructing a hypothetical pattern of economic development. There are theoretical models in which a very small exogenous change in the early stages of growth may have very large consequences later on. This proves very little, but it is a warning to us to be careful in performing intellectual experiments on economic history. In referring to a much broader topic than that before us—the evolution of the world economy since the mid-eighteenth century—W. W. Rostow wrote that "modern economic theory offers its students no agreed framework for disciplining such a story of growth and fluctuation." I think that in attempting to discipline the story of Canadian growth and fluctuation Young has tackled a very difficult job.

He will have to face certain questions, particularly those having to do with the applicability to the Canadian situation of the explicit and implicit assumptions belonging to the theory of resource allocation that he cites. Questions concerning the internal and external mobility of resources are crucial to allocation questions. Has protection diminished the flow of resources into the more desirable (unprotected) industries in allowing them to flow into the less desirable (protected) industries? Or has protection merely meant a

larger economy? Has it simply allowed a protected sector of the economy to develop alongside the unprotected sector without diminishing the size of the latter? And if so, to what extent has the greater size of the economy helped to reduce the per capita overhead costs of nationhood and to enlarge the market, incidentally increasing the opportunities to take advantage of economies of scale? And is it really true in the historical circumstances that if the tariff has attracted capital and enterprise, the returns to labor and land must necessarily have been reduced relative to the American? What are the implications of economic fluctuations and unpredictable swings in world demand? Has the presence of protected industries meant that per capita income has been higher than it otherwise would have been when foreign demand for exports has been slack? What have been the dynamic repercussions within the system of economic growth? Have the indirect consequences of protection stimulated economic growth or per capita income? Or the contrary?

Theory creates a very strong presumption that the Canadian tariff is guilty of the charge brought against it, but I should prefer, for the present, neither to acquit nor to convict but to fall back on that Scottish verdict, "Charge not proven." The author deserves our hearty thanks for having embarked on this piece of criminal investigation. He has picked an intriguing subject, and in his further pursuit of it he deserves all our good wishes for resounding success.

W. Duane Evans: I found both of these studies interesting and informative. I shall direct my remarks principally to Mr. Frankel's paper, although the later comments will, I think, have some relevance to the origins and persistence of the Canadian-American productivity differences which Mr. Young finds.

Mr. Frankel begins his paper with a table of rough US/UK productivity differentials for some thirty manufacturing industries (developed from the US *Census of Manufactures* for 1947 and the British *Census of Production* for 1948). He stresses the approximate nature of such comparisons, even when they are based on supposedly comparable physical measures of production, and his points are well taken. Few Americans, for example, with personal experience of British beer are likely to be completely satisfied with any direct physical basis of comparison, and I may add that most Britons feel just the same way about it.

Mr. Frankel says of his group of thirty industries that "there is little reason to suppose that the general impression it conveys of that sector (manufacturing) is seriously misleading." I agree with the statement, but I regard it as far from self-evident. The group certainly gives inadequate representation to the entire metals-machinery-equipment and metals fabrication area of manufacturing, which is represented exclusively by tin containers, pig iron, radio receiving tubes, bicycles, and razor blades. A broader picture is conveyed in the careful and more comprehensive studies of Laszlo Rostas which, however, are based on prewar data. But these, when supplemented by the various available trend studies of Rostas and others, show that the basic

postwar situation remains much the same as before. Mr. Frankel's findings are generally consistent with this very large body of work, and it is the existence of the latter which makes it probable that no serious challenge to the impressions gained from this limited sample of industries will be offered.

The author ranks his industries by the indicated size of the US/UK productivity ratio and remarks that no obvious explanation of the rankings presents itself. I shall suggest (without pressing the point) that, with some exceptions for special reasons, productivity differentials tend to be smaller for items with a relatively static product design and/or technology of production. For example, the product design of a smoked fish remains much the same, and, referring again to Rostas, the US advantage in motor vehicle production is greater than for bicycles, where model changes are somewhat less frequent and drastic.

Mr. Frankel begins his examination of possible causal factors with a discussion of the optimum use of resources in a given environment. I think this might be clarified by contrasting the concepts of efficiency and productivity. Efficiency typically connotes comparison with some more or less explicit standard which represents perfection. Many efficiency concepts are related in a rather static way to productivity. For example, proper skill and application levels in the work force or reduction in rejects and rework in the course of manufacture are efficiency concepts which have relevance to productivity. However, all these notions have one thing in common: once perfection has been achieved, no further improvement is possible. It seems to me that the notion of optimum use of resources in a given environment is a concept of the efficiency type.

Productivity, in contrast, is a ratio without an upper limit. It is closely related in concept with the idea of a changing technology, and its connotations are dynamic. If productivity is doubled, there is no inherent reason why it cannot be doubled again and yet again, and no comparison with perfection or any standard of excellence is implied. One firm, for example, may be highly efficient in the sense that it operates smoothly and without waste of resources in the context of the technology it employs, but at the same time it may be unprogressive, only marginally profitable, and with dim prospects for the future unless changes are made. Another firm may be inefficient in obvious ways, but progressive, productive, and profitable. I think comparable distinctions are important at the national level, and it is not efficiency in any ordinary sense that will be most relevant to international productivity comparisons.

As explanatory hypotheses for the differences in US/UK productivity, Mr. Frankel lists and examines differences in resources, equipment, market size, and plant size. In his final section, he adds differences in managerial and union attitudes and structures, workshop organization and control, and specialization of labor. He suggests that inadequate weight is frequently given in current discussions to these latter factors.

I was a little surprised that no mention was made of differences in labor, management, and consumer attitudes toward competition, and the degree of

competition prevailing. It is difficult to deal with this complex question in any quantitative way, but certainly many economists have felt that it is of importance in understanding productivity differences. Other topics for examination could also be listed, such as the training and educational system for the work force and the general public, distribution and marketing practices, consumer attitudes, the social structure and its effects, the relative importance of financial or production orientation among those who control industry, and many more. However, a number of the topics listed by Mr. Frankel and those which I have added as well seem to be less explanatory hypotheses than subjects for concomitant study. For example, if it is conceded that competition in Great Britain tends to be somewhat more restrained and hence exerts less pressure toward improvements in production techniques—and I believe this to be true—a most relevant question is surely why the role of competition is so different in two countries whose origins and history are so closely linked. I believe the basis for a fairly inclusive generalization exists.

To approach this quite directly, the technical ability of man to alter and reshape his environment, which had changed but gradually over a millennium or two, has jumped in the last two centuries by one to two complete orders of magnitude. The complex modern Western industrial economy, with its vastly different demands on and rewards to the average man, has no counterpart in earlier history. This technical revolution has in turn required far-reaching adjustments and alterations in basic social and economic structures and institutions. In the relatively isolated United States, these profound adjustments were made during a period when labor was scarce, not in relation to capital, which was also scarce, but rather in relation to the abundant opportunities for productive and profitable use which were everywhere evident. Comparable adjustments in Europe and Britain had to be carried through in a period when there was a surplus of labor in relation to visible opportunity. It is suggested that the differences in social and economic institutions and attitudes thus engendered have had a profound, pervasive, and persistent effect on the course of relative technical and economic development.

Some such hypothesis might well be suggested by evidence presented in Mr. Frankel's paper. He avoids one rather common misconception. Some persons, thinking perhaps of the more prominent position of the United States in world affairs following World War I, have been receptive to the facile conclusion that its leadership in productivity is a fairly recent development. It is clear that quite different explanations for the current US advantage will seem reasonable, depending on whether this is a recent happening or one of longer standing. The evidence presented by Mr. Frankel supports this latter conclusion. Indeed, I would not too readily concede even as much as Mr. Frankel, that "the inception of Britain's relative disadvantage belongs somewhere within the past century." One can as reasonably place it earlier. The very fact that productivity differences between the countries have had so long a history is a clear indication that explanations must be sought not in the rapidly changing realm of science and technology per se but rather in the less flexible and longer lived family of institutions and attitudes.

There have been, of course, many contributory factors, some of which have been mentioned. Others might include the linking in the United States of peoples of diverse origins, thus broadening the competition of ideas and avoiding traditionalism; the cultivation of a spirit of enterprise, because those who made the journey across an ocean and to a rough new continent more than a century ago must in the main have possessed it; the spreading of people over a vast land area and the receptiveness to mobility and change this inculcated; and others. Mr. Frankel rightly calls attention to the importance of opportunities on the land and at the frontier in earlier days.

With reference to Mr. Young's paper, I shall here suggest that traditionalism and social and economic institutions patterned to a greater degree around England and the Old World are more common in Canada than in the United States, and hence may have a significant bearing on the existence and continuity of the productivity differences which he finds.

Returning to Mr. Frankel's paper, it is said "the conventionally assumed relationship between land supply, wage rates, and intensive mechanization is not contested here." I think it is quite important to do so, because the conventional approach leads so many simply to the examination of substitution effects. This is an elegant tool for analysis where technology is essentially static, but inappropriate otherwise. Take, for example, a simple situation in the area from which the marginal approach was developed. A new seed variety —and we have new ones nearly every day—may with just the same land, labor, and capital give us substantially greater agricultural production. In other words, productivity has increased in terms of each factor of input, not because of substitution among them, but through the substitution of knowledge for ignorance. Much the same thing may happen when we obtain our textile fibers from chemical equipment and industrial labor in place of the farm land and farm labor used in making cotton. The great discovery of the technical era is that, through knowledge properly applied, we may be able to attain greater realized output in terms of every factor of production. The full significance of this was in no way appreciated in the nineteenth century. I doubt that it is in the twentieth.

I cannot close my remarks without recalling a debt which we can now repay only with remembrance. I refer to the untimely death at Cambridge in October of Dr. Laszlo Rostas, whose contributions to the study of international productivity differences, in my opinion, exceed those of any other man. His initial findings on US/UK differences, published in 1943, were greeted in some quarters with varying amounts of skepticism, amazement, and even indignation. It was his introduction, after valuable earlier work in other fields, to this curious subject where those with the least right to them often seem to hold the strongest opinions. The work of many scholars in subsequent years has served, of course, to validate the conclusions he offered. I am sure that the rather intense public discussions which were aroused by Rostas' work rather startled him, since he was by nature a gentle, quiet, and scholarly man. Nevertheless, it was in the climate created by these discussions that the postwar British productivity improvement program grew. I think it was Rostas'

initial valuable work and his quiet insistence on sticking with the facts which contributed more than anything else to the creation of the Anglo-American Council on Productivity and more recently the British Productivity Council. It branched across the Channel to the productivity work of the Organization for European Economic Co-operation and the more recently created European Productivity Agency, to both of which Rostas contributed personally as well as indirectly. He has richly earned from many of us our lasting gratitude.

REGIONAL ECONOMICS

CRITERIA FOR EVALUATING REGIONAL DEVELOPMENT PROGRAMS

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I

A regional development program will suggest different things to different individuals, and to all it is likely to suggest not a single program but a number of related programs focusing on a common objective. To a staff member of a development agency, a regional development program implies literally scores of individual programs ranging from those involving engineering projects to those basically educational in nature carried out co-operatively with educational and other regional institutions. Since these programs are neither comparable nor amenable to uniform methods of analysis, a complete discussion of criteria for their evaluation cannot be attempted in a paper such as this. This paper will discuss the problem only in general terms, therefore, to sketch out at least the nature of the problem and to inquire into some general lines of approach in handling it.

To indicate the scope of the paper and to begin with a common understanding as to terminology, let us start by defining what will be meant by various terms employed.

This paper will skirt the controversy as to what constitutes a region, since opinions among economists vary from a belief that the concept of a region has little value,[2] to the opposite position that there can be demarcated "but one best set of regions."[3] For the purpose of this discussion it will be adequate to define a region simply as an identifiable geographical area, whether a river basin, an administrative unit, or a combination of administrative units, depending on the specific problem at hand. Regions to be considered will be subareas of the United States and thus will represent open economics engaging in interregional trade. The paper will confine itself, also, largely to the problem of relatively underdeveloped regions.

[1] The author is indebted to Pierre Crosson, Henry Erlanger, John Peterson, and Vernon Ruttan, of the TVA, and Otto Eckstein for their comments and suggestions on an earlier draft of the paper.

[2] Rutledge Vining, "The Study of the Spatial Structure of an Economic System." Paper presented at the December, 1951, meetings of the American Economic Association.

[3] Walter Isard, "Some Emerging Concepts and Techniques for Regional Analysis" (*Proceedings* of the Western Exploratory Group of the Social Science Research Council on Regional Economic Analysis, Berkeley, 1952).

Regional development, for our purposes, will be defined as a process resulting in a secular growth of regional output or real income. (This, of course, is less than a comprehensive definition of regional development, as many intangible aspects of development are not susceptible of measurement by a monetary yardstick.) This growth can occur autonomously. It may be influenced, also, by the impact of national economic expansion imparted through the private sector of the economy. A regional development program, therefore, must be distinguished as an influence exogenous to the normal functioning of the private economy. For the purpose of this discussion, a regional development program will be defined as a public undertaking, most likely a governmental undertaking, one of whose primary objectives is to influence the underlying factors affecting regional output.

II

Attempts at evaluating regional development programs in the past have frequently used an aggregate economic indicator, such as total personal income, to compare relative changes for a region in which a development program exists with relative changes for another region. This comparison between two regions over an appropriate time period is assumed to reveal the extent to which development efforts have been economically justified.[4] This procedure is dubious at best for it implies that the development efforts being evaluated, to be effective, must have exercised a dominant influence on regional income—and in the relatively short run. The fact that statistical data which have been compiled in such attempts to evaluate the TVA, for example, have not appreciably influenced the area of agreement regarding the value of TVA programs suggests that this approach falls short of providing evaluative results. An examination of the implicit assumptions underlying this approach will afford some excellent reasons why this may be the case.

First, an evaluation by this method implicitly assumes that the comparison being made is between a region which has a development program and one in which such a program is lacking. But if relative changes in total income are used to measure regional development, the influence of other governmental programs which affect regional income, regardless of the administrative device employed, must be eliminated from both regions to provide the *ceteris paribus* conditions essential for a valid comparison. It is seldom recognized, for example, that the

[4] See, for examples, B. U. Ratchford, "Government Action or Private Enterprise in River Basin Development: An Economist's View," and discussant Joseph Ransmeier's remarks, AEA *Papers and Proceedings*, May, 1951, pp. 304-306, 311-312. Also, "Study of Agricultural and Economic Problems of the Cotton Belt," *Hearings before Special Subcommittee on Cotton of the Committee on Agriculture* (House of Representatives, 80th Congress), p. 687.

activities of the TVA to a considerable extent supplant activities which are carried out by a number of other federal agencies in other regions. The relative magnitude of governmental expenditures for programs other than resource development is likewise almost never taken into account. Federal expenditures for military procurement in California and New York during a five-year period (1950-54), for example, were roughly seven times as large as federal expenditures associated with the TVA over a twenty-one year period. In many other states, although not as large, they were multiples of the twenty-one year total of TVA expenditures. These expenditures, along with grants-in-aid to states, federal construction, and various other direct governmental activities throughout the nation, suggest that the absence of valley authorities does not preclude the possibility that federal expenditures in regions other than the Tennessee Valley account directly for a larger portion of their growth in income.

Second, regional comparisons of income relatives as a method of evaluation implicitly assumes that the activities of development agencies are encompassed within a relatively well-defined geographical area. In reality, since development agencies usually have responsibility for a number of resource problems rather than the economy of a well-defined region, development activities may radiate into adjacent regions observing no common boundary for the entire "package" of resource development programs. For example, the water control program of the TVA is confined to the 125 watershed counties in parts of seven Valley states. The power program relates to a somewhat different area of about 170 counties in these states. TVA's activities in regard to tributary watershed development involve relations with the seven Valley states and its national responsibilities for fertilizer research and development involve co-operative relations with institutions in 35 states. The incidence of benefits stemming from these programs, moreover, is not confined to the areas in which the programs are centered. It is not meaningful, therefore, to take one area influenced by a development program for comparison with another area in which the program's influence has also been felt, in evaluating program results.

Third, such attempts at evaluation involve hidden assumptions that, despite differences in the variety and quality of resources which exist among regions, all regions have a uniform development potential. Stated differently, an assumption is implied that regardless of the differences which may exist among regions in all other determining variables, every region can be expected to develop economically as rapidly as another except for the presence or absence of a development program.

To sum up, then, past attempts to evaluate regional development

programs by comparisons of income relatives have not examined critically what constitutes a regional development program apart from the administrative machinery used to implement it, what constitutes a region for the purpose at hand, and how realistic are other assumptions which are implied to hold.

However, quite apart from these critical observations, there remains another question of importance which seemingly has escaped attention. The degree to which a program can be expected to stimulate regional development depends largely upon the magnitude of the program relative to the total of other factors affecting the region's development. A comprehensive regional development program might conceivably involve responsibilities for monetary and fiscal policy, welfare programs, regulation of transportation rates, interregional trade and migration, and other governmental activities which vary with political philosophies and the contingencies of a particular time and place. Such programs would involve all of the measures with which government can influence the level of income. By contrast, regional development efforts in the United States, such as resource development programs, represent efforts of rather limited scope when viewed in relation to the aggregate of economic activities which engage the productive factors of a region. Given the margin of error in our economic data, is the influence which such limited development programs can be expected to have on regional income capable of being accurately indicated by comparisons of relative changes?

It has been observed by Morgenstern that a probable error of 10 per cent attaches to our estimates of national income. (*On the Accuracy of Economic Observations*, page 84.) There is little reason to believe that estimates of income on the regional level are more accurate. If these estimates are used to provide measures of relative change, a regional development program would have to contribute a third to the income of a region in a given year before its influence would be equal to the range of possible error in an index whose base (prior to program introduction) and given year estimates are subject to a 10 per cent error. To illustrate: The index of estimated income payments from manufacturing for the year 1953 (1929 = 100) was 543 for the 11 southeastern states and 602 for the 201 counties representing the Tennessee Valley and TVA power service area—a difference of 59 percentage points. If we assume that the true income was underestimated for the Tennessee Valley while overestimated for the Southeast in the base year, and overestimated in the given year for the Tennessee Valley while underestimated for the Southeast (all by as little as 10 per cent), the true index would be 664 for the Southeast and but 493

for the Tennessee Valley. If estimating errors of opposite sign but equivalent magnitude for the base and given years are assumed, the true index for the Southeast would be 445 and 735 for the Tennessee Valley. With a range of possible error exceeding 200 percentage points in the index, we cannot feel secure that the indicated difference of 59 percentage points has not been influenced more by errors of estimation than by the development program. Since errors in estimating can produce a wider range of differences in our income relatives than can be realistically anticipated from the influence of limited development programs, one can legitimately question the validity of using comparative data on income (and other) relatives to evaluate development program results.

III

If relative changes in our economic data are not likely to provide a sufficiently accurate basis for evaluating development programs, what alternatives remain? The most fruitful approach, it seems, is one which examines each program activity individually for its impact on the sector of the economy toward which it is directed. One method of this type seeks to provide approximations of real income produced (or losses averted) by such programs which can then be compared quantitatively with costs. This procedure is used to indicate whether the criterion of efficient resourse allocation has been met.

This approach presents several problems. It is desirable to recognize a specific limitation at the outset. Taking the TVA as an example, again, there are programs such as flood control, navigation, and power for which the development agency has exclusive responsibility and from which direct benefits are largely tangible. On the other hand, there are programs, such as tributary watersheds, stream sanitation, forestry, agriculture, and scores of others, which are co-operative ventures involving agencies of state and local government in addition to TVA. These programs involve research, development, and demonstration, in the main, and are fundamentally educational in orientation. Given the state of our research methods and knowledge, developmental results of some of these programs are scarcely less difficult to assay than results of research and public education generally, nor can quantitative valuation be placed on them more easily. With limitations on estimating the benefits of this type of program and shared responsibility for the results, a precise quantitative comparison of benefits and costs from the agency viewpoint does not seem feasible.

This type of program, however, has accounted for only about 10-15 per cent of total expenditures in the case of TVA. The major portion of this relatively small share, moreover, is accounted for by TVA's

national responsibilities for fertilizer research and development and defense chemicals. Costs of the fertilizer and munitions program, while not found in other regions, are largely recovered by sale of munitions to defense establishments and receipts from fertilizers distributed in agricultural programs. Resource development expenditures, apart from the chemical, power, navigation, and flood control programs, therefore, have accounted for only about 3-4 per cent of total program expenditures. The remaining and preponderant portion of expenditures is more readily amenable to quantitative analysis.

Accordingly, an evaluation might proceed by analysis of each program activity which provides opportunity for quantitative evaluation. This will permit judgment as to how efficient an allocation of resources the major portion of program activities represents. In the private sector, of course, the pricing system is assumed to provide a reasonably efficient method of allocation. In the public sector, on the other hand, investment decisions must often be made to provide services which are not available through conventional markets. Public revenues from taxation can be used for these purposes without reference to costs in the capital market, while valuation of the services provided also frequently cannot be obtained directly from the operation of product markets.

This poses a difficult problem of establishing procedures for estimating costs and "returns" to which a good deal of attention has been given and to which a satisfactory solution may emerge. The continuing work of the Subcommittee on Benefits and Costs of the Federal Interagency River Basin Committee[5] is developing a conceptual framework for estimating benefits and costs of river basin projects. Briefly, the method of estimating costs recommended includes imputation of a rate of interest to cover real costs of project capital as well as other costs incurred through conventional factor markets. Valuation of services provided is made by estimating actual or imputed market value of these services, usually measured by the cost of the most economical alternate method of providing similar services. A ratio of benefits to costs is then computed and, assuming that project capital (and other factors) would otherwise be employed at the margin where returns would be just equal to costs, opportunity costs will be met for the total of factors employed in the project if the benefit-cost ratio exceeds unity.

This *ex ante* approach to investment decisions in the public sector can be extended with appropriate modification to evaluation of such

[5] *Proposed Practices for Economic Analysis of River Basin Projects;* see also John M. Clark, Eugene L. Grant, Maurice W. Kelso, *Report of the Panel of Consultants on Secondary or Indirect Benefits of Water-Use Projects,* to Michael W. Straus, Commissioner, Bureau of Reclamation.

programs after they have been in operation. Established operating programs, moreover, provide known construction and operating costs and experience on which to base estimates of benefits. In this connection one consideration bears stressing. Facilities employed in such programs have useful lives which are limited, in the main, only by technological obsolescence. Related development which such programs induce will doubtless require some time to gain momentum. Evaluation of existing programs, therefore, should avoid judgment based on the first year's or an average of early years' results. Cumulative costs over the life of the program should be considered in relation to cumulative benefits expected to accrue over the entire life of the facilities as is done in conventional benefit-cost analyses. Projections based on experience with costs and benefits to date should facilitate estimating realistic cumulative totals. The problem posed by the difference in time distribution of outlays and benefits must be taken into account, of course, and can be handled by use of the interest rate or discount factor.

While this procedure provides criteria for evaluting development programs, it has a national rather than a regional focus; i.e., it is addressed to the problem of allocating resources efficiently within the total economy. Without supplementary analysis to determine the spatial distribution of benefits from program activities, it fails to provide much insight into the effect such programs have had on the development of the region itself. To answer this question, a somewhat different approach may be preferred for analysis and evaluation from a regional viewpoint.

IV

Regional development has been defined as a process resulting in a secular rise in regional output or real income. Increasing regional output and income implies both expansion of the region's productive capacity and growth of effective demand for the region's output. Both conditions are necessary and combined will represent a sufficient condition for regional development. Attention has often been sharply focused on increasing output through stimulating increased participation of underutilized resources and/or increasing the productivity of resources being employed. Perhaps not enough attention has been directed to the process by which effective demand may be increased; namely, through retaining an adequate share of the resulting increased factor receipts in the region to increase the region's effective demand for its own output and ensuring that the increased output include goods and services for which there is a highly elastic demand both from within and outside the region.

The demand aspect in regional development becomes particularly

important when viewed in the light of a rising secular trend in national income. In fact, resource development programs derive their justification largely from the implicit assumption that long-run economic growth will require the factors or services provided by such programs. This assumption must be examined carefully, however, in connection with each program activity. But within the context of an expanding national economy, the degree to which development efforts will make a contribution to underdeveloped regions will depend on how effectively they assist the regions to supply, over time, a greater share of the total economy's expanding demand for goods and services.

Development programs may be evaluated from the regional viewpoint, accordingly, in terms of their aid in increasing the productive capacity of the region and in stimulating effective demand for the region's output.

To promote these dual objectives, resource development programs of the kind undertaken by the federal government should focus attention (within the limitation of their statutory authority) on influencing the supply functions of factors for which demand is highly responsive to secularly rising income nationally. These factors may be referred to as "strategic" factors. They will consist of productive factors for which demand will be relatively elastic both with respect to price and income, and favorably influenced by changing technology and tastes. Development programs which alter favorably the supply functions of strategic resources will improve the region's competitive position in the national market. Cross-elasticity of the derived demand for localized resources will increase the probability that location advantages thus provided will attract external capital to the region. Branch plants of national concerns represent a typical form of such capital movements in a nationally expanding economy. If the strategic factors, furthermore, are required by "growth" industries, i.e., those industries for which product demand is income elastic and influenced positively by the trend in changing consumer preferences, the rate at which capital formation will occur in response to shifts in regional supply functions and the extent to which these and complementary resources will be employed can be expected to increase.

Criteria for evaluating the developmental effects of regional development programs might then be: how effective were the development programs in shifting the supply function of factors on which their efforts were focused and how strategic, as indicated by their demand characteristics, were the factors whose supply functions were thus affected?

As an illustration, we know that multiple-purpose development of the Tennessee River, by altering the production function for the region's

power, produced a substantial shift in the supply schedule. Development of an inland waterway increased the supply of low-cost transport services. The water control program, by regularizing stream flows and permitting settling to occur in the reservoirs, lowered the cost and increased the dependable supply of high-quality processing and cooling water.

We know that these factors, i.e., power, water, and in some cases water transport, are basic inputs in the chemical industry, which incidentally has experienced a half-century of sustained vigorous growth. With respect to product demand, as an example, we know that changing technology, rising income, and changing consumer preferences have altered the derived demand for industrial fibers. There has been a spectacular substitution of synthetic for natural fibers. This in turn has fostered a vigorous demand for factors employed in the production of synthetics. In response to this growing national demand and the procurement advantages in the Tennessee Valley for basic inputs, investment in facilities along the Tennessee River for the production of synthetic fibers has exceeded 50 million dollars during the past several years alone.

Stimulating capital formation is not limited to providing procurement, processing, and distribution advantages directly for new industrial enterprise. Such advantages provided originally may be reinforced by triggered developments. The most spectacular illustration of this in the Tennessee Valley is the developing chemical complex at Calvert City, Kentucky, near the base of Kentucky Dam. The initial development at Calvert City took place in 1948 when Pennsylvania Salt Manufacturing Company erected a hydrofluoric acid plant. In addition to fluorspar, the basic requirements of the firm were relatively low-cost electric energy, large quantities of processing and cooling water, and water transportation for shipment of sulphur and salt. Concurrently, the Pittsburgh Metallurgical Company built facilities for producing ferroalloys to realize savings through joint development of docking and rail facilities. Pennsalt added a chlorine plant which, along with B. F. Goodrich's plans to locate vinyl chloride facilities in the area, prompted construction of a calcium carbide and acetylene plant by Air Reduction. The latter's location decision was influenced by the favorable source of intermediate products supplied jointly by Pennsalt and Goodrich, along with other favorable location characteristics of the area. These three firms now have two plants each at Calvert City which, along with Pittsburgh Metallurgical Company and the recent addition of General Aniline and Film Corporation, represent an investment of approximately 70 million dollars—only slightly short of the total investment in flood

control, navigation, and power facilities of the Kentucky Dam project. This capacity has been built within a period of ten years after completion of the dam. The favorable opportunities for realizing agglomeration economies provided by the developing industrial complex, moreover, suggest a triggered development which in the long run will dwarf the resource development expenditures necessary, although not sufficient, to spark it initially.

Analyses of the industrial demand for power, use of the navigation channel for movement of bulk materials, and use of industrial water supplies in the Tennessee Valley suggest that the water resource development programs have attracted the light metals industries, additive metals using electrometallurgy, synthetic fibers, and other chemical industries. Investment since the beginning of TVA's resource development activities in plant and facilities along the Tennessee River (exclusive of TVA's installations) for which industrial water supplies, water transportation, and/or relatively inexpensive electrial energy are significant location factors, totals approximately 2 billion dollars. Data and conceptual limitations preclude our measuring how much the rate of investment has been increased. We know, however, by computing the location quotients for these industries, that a larger proportion of the rapidly growing new capacity nationally has been built in the Tennessee Valley since the advent of the resource development programs than was being built prior to it.

Although the rate at which capital is formed will affect the rate at which regional income will increase, there may exist a sufficient difference in the ratio of the increment in income to the increment in investment, over time, to merit comment. Investment expenditures of a development program in an underdeveloped region, as well as triggered investment in the early phases of development, will produce something less than the full multiplier effect on that region's income. In the first place, the region will be unable to supply from domestic production a large part of the investment goods required for the program. In the second place, as indicated by family budget studies and the economic structure of underdeveloped regions, the marginal propensity to import from the rest of the economy associated with the second as well as the first round of new expenditures is likely to be very great in relation to the marginal propensity to import from the region by the rest of the national economy. This results from the low income elasticity of demand for a large portion of the region's output (agricultural products, textiles, etc.). The net effect of the regional multiplier will be restricted largely to that produced by expenditures for investment goods and services which can be supplied from regional production. Only a small

additional export multiplier can be anticipated from the national economy's imports from the region resulting from its exports of investment goods to the region.[6] Accordingly, despite the high marginal propensity to consume among low income underdeveloped regions, the region's inelastic supply of investment goods and the low income elasticity of demand for the region's output, in the short run, will limit the multiplier effect of capital formation on the region itself.

If the regional development programs have focused on development of strategic resources, increased factor receipts from the employment of these resources in the region by material-oriented industries will provide, in time, the increment to total income necessary and sufficient to attract market-oriented consumer goods industries for which final demand is income elastic. This process of development reflects a change in the composition as well as level of regional output. If the region thus increases its capacity to supply from home production its demand for income-elastic goods as well as supply a larger part of the expansion in demand originating nationally, *ceteris paribus*, the regional multiplier effect of capital formation both regionally (investment multiplier) and nationally (export multiplier) will tend to increase.[7]

The effects on capital formation and the income multiplier of development programs which improve the region's capacity to supply strategic factors can be contrasted with results to be anticipated from

[6] The regional multiplier in this case will be similar to an investment multiplier involving two countries (cf. Fritz Machlup, *International Trade and the Foreign Trade Multiplier*, pp. 175-176) where the fraction of investment goods and services provided by domestic production is equivalent to "home investment" in the Machlup formulation and the fraction of investment items provided from outside the region is akin to investment in the "second country."

The regional multiplier can be expressed as follows:

$$y = \frac{ai\,(s' + m') + m'a'i}{(s' + m')\,(s + m) - m'm} \quad \text{and} \quad k = \frac{a(s' + m') + m'a'}{(s' + m')\,(s + m) - m'm}$$

Where:

y = change in regional income associated with new investment; i = total amount of new investment; a = fraction of investment goods and services provided by regional capacity; a' = fraction of investment items provided by remainder of the economy, m = marginal propensity to import by the region; m' = marginal propensity to import from the region by remainder of the economy; s = marginal propensity to save in the region; s' = marginal propensity to save of the remainder of the economy; k = the regional multiplier.

[7] The increase in regional income accompanying new capital formation can be obtained from the following expression:

$$y = \frac{ai(s' + m') + m'(a'i + i')}{(s' + m')\,(s + m) - m'm}$$

Where all symbols remain as previously defined while i' represents new investment nationally outside the region. The numerator will be increased by larger values of a and m' in the first term and the increased value of m' which applies to i' as well as the decreased value of a' in the second term. The denominator will be decreased by opposite changes in values of m and m'. The latter follows because of the different order of magnitude in the change in import propensities governed by the relative magnitude of the trading areas.

programs which focus on resources for which demand is relatively inelastic. The agricultural sector is useful as an illustration in this case because final demand for agricultural products generally is characterized by both price and income inelasticity. Growth in demand for agricultural output and hence for total factor input will not be proportional to growth of national income. Although substitution of factors, e.g., fertilizers and capital for land and labor, may result in a derived demand for some factors employed in agriculture to grow more than proportionally with demand for agricultural output, aggregate factor demand in agriculture will be subject to relative decline. Given an absence of production controls and price supports, resource development programs which contribute to increasing the aggregate factor employment in agriculture would tend to affect adversely the terms of trade between agriculture and other sectors of the economy. Because of inelastic demand, income from agriculture may decline by virtue of the increase in output. For a region which is predominantly agricultural and seeks to achieve development through these means, the development effort will produce an extraregional consumers' surplus with regional benefits being eroded away by adverse changes in the terms of interregional trade.

V

In summary, one may conclude that any meaningful evaluation of a regional development program requires intimate knowledge of the many activities which it represents. Furthermore, an approach which attempts to evaluate each program activity individually for its impact on the sector of the economy toward which it is directed is more promising than one which attempts to determine justification for the entire package of development programs by analyses conducted at levels several stages removed from the area of direct program impact. Moreover, it is probable that development programs which are financed nationally have essentially a national rather than a regional focus and that benefits from such programs are not confined within the region in which the program is centered. Regional comparisons of relative change in so-called "economic indicators," therefore, are not appropriate to the problem being posed. Moreover, because of the wide margin of possible error in indexes using such data, they provide a specious measure of the success of regional development programs, even should other conditions required for their use be fulfilled.

Benefit-cost analysis, while approaching the problem at the appropriate level, is designed to provide an investment criterion rather than criteria for evaluating developmental effects on the region in which the program is centered. Perhaps more useful for this latter purpose is an

analysis of the process of development and how regional development programs may influence that process. This requires an examination of the effects such programs have on the parameters of the region's production and consumption functions over time and the trend in the structure of markets. Although precise quantitative criteria may be more difficult to formulate in this case, an approach along these lines is likely to be more relevant, more informative, and more suited for analysis of the dynamic aspects inherent in problems of economic development.

REGIONAL ECONOMIC REACTION PATHS

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When the economy of a region is subjected to changes in the level of activity of one or more of its sectors, both the real structure of the regional economy and the monetary flow of receipts and expenditures between it and other "economies" affect the character of the response to that change. For a given change in the level of economic activity the effects on income, employment output, etc., will be described as a reaction path for the region. It is the purpose of this paper to suggest certain kinds of changes in economic activity which may prove fruitful to analyze and to attempt to measure quantitatively the effects on specific regional economies of given types of change; that is, to describe certain kinds of these reaction paths. In order to trace reactions to changes in economic activity, it is necessary that the interrelationships among the sectors in the regional economy be specified as to form and be measurable. Although it may be possible to trace through the effects without the aid of a formal model (though on this point I have my doubts), I shall use input-output (or interindustry) models for the states of Utah and of California as the vehicles for measuring regional effects of changes in economic activity; for these kinds of problems such models have virtues which I hope will become apparent as the discussion goes along.

The paper is divided into three parts. First, some discussion of static input-output models, their relevance for regional problems, and the defects which may make the purely static model inadequate is necessary. This section is limited to a very few comments which lead particularly to the model described in the third section of the paper. Second, using the input-output models for Utah and California, changes in income and employment in those states resulting from changes in the "external" demand for individual industries will be examined. The measures developed may be considered as income and employment multipliers. An extension of these techniques also yields estimates of accelerator coefficients for California. Third, the California input-output model will be adapted to the computation methods for linear programing so that a dynamic model of growth over the period 1954-60 may be examined.

I

It is too much to expect that the regions in the United States with which we work will normally exhibit a balanced economic structure.

There is, of course, room for a variety of definitions of the appropriate regional unit, and the economist, geographer, political scientist, and urban specialist can choose the unit most appropriate to his problem. There is merit, I think, in considering the state as a basic unit for regional economic models, since among other reasons, it is sovereign in an interesting area of economic policy making. Unlike the nation-state, however, the police power of the state does not extend to laying restrictions on interstate commerce. Let us consider just a few implications of that prohibition against interference with interstate commerce on the part of states, as it affects regional models and regional analysis.

In constructing a regional input-output model such as the ones for Utah and California which are used later in this paper, the analyst has the choice of letting the cells show the total demands of the industries in the state without distinguishing those demands satisfied by industrial capacity in the state from those satisfied by "imports." Alternatively, the gross flows table can be constructed so as to show the intrastate flows alone, relegating imports (and exports) to the exogenous final demand sectors. The Utah and California models follow the second method with the result that the intrastate flows are well articulated, but a side calculation of serious proportions is necessary in order to account properly for imports. All this is old hat to the seasoned input-output analyst, but consider how it complicates the analysis of regional growth. For a given regional input-output model, assume that the outputs from all industries necessary to support the delivery of a given level of final demand (for example, regional consumption and investment demands, and exports) have been computed. A comparison between the required level of output and regional capacity can then be made for each industry individually. If for one or more industries required output is greater than capacity, a choice is implied between building new capacity in the region or raising imports. Short-run prospects of drawing down existing inventories or rationing of demand through price increases are ruled out for the moment.

Whether the region becomes permanently a deficit area by increasing imports or makes a readjustment by building new capacity depends on the cost comparisons, not only in the deficit industries, but in all industries in the region. If some industries have exportable surpluses while others have deficits, comparative cost studies will determine the most desirable course of action. The deficits may accumulate; or the region's comparative cost advantages may point to a further development of the industries which already are net exporters. If a choice must be made between two deficit industries, the cost studies will show the efficient relative rate of growth of the two in the region. In any case, a formal input-output model does not automatically supply the answer

or the criteria by which the choice is to be made. All it can show is the "trade off" in real cost between development in one industry and the alternatives of development in other industries which are thereby foregone. The direct cost of adding a unit of capacity to a given industry is measured by the set of capital coefficients (i.e., the real quantities demanded in constant dollars per unit of capacity) appropriate to that industry. An increase of X units in capacity thus requires X times each capital coefficient from other industries in the state or from imports.

The problem may be framed in another way to ask whether a given bill of goods is feasible in a static model which allows capital building to take place but which makes no explicit allowance for time lags. Assume as before that for the given bill of goods the output required to satisfy it has been determined by multiplying the vector of final demand by the inverse matrix, thus getting both the direct and indirect requirements for output. If the generated output is greater than existing capacity for one or more industries, new capacity building must take place. This in turn places additional requirements on the other industries in the region, and one or more of these suppliers may in turn require an expansion of facilities. Such a model thus gives rise to two sets of equations of the following form:

$$(1)\ X_i = \Sigma_j a_{ij} X_j + \Sigma_j b_{ij} m_j + f_i$$
$$(2)\ C_i = X_i - m_i + u_i$$

where X_i = current output; C_i = initial capacity; f_i = final demand; u_i = unused capacity—all for industry i and where $[a_{ij}]$ and $[b_{ij}]$ are flow and capital coefficients respectively; m is the vector of additions to capacity built during the period under analysis.

The first set of equations shows the disposition of current output among the alternative uses of sales on current and capital account and to final users. The second set of equations simply shows the allocation of capacity to uses including the possibility of its being unused. These equations thus are perfectly straightforward applications of social accounts principles. They may be compared with the equations in the third section of this paper.

Since choices between use of resources on current or on capital account may be made, this model could be calculated by linear programing methods; but since it is a purely static model, there are no lags in building and using new capacity so that the solution, if there is one, must satisfy the final demand subject to the restriction that capacity must be at least equal to requirements for output from this industry on current account and capital account. There may be no solution, since each capacity expansion in one industry may generate new capacity requirements in other industries. The model then "explodes."

Thus, such a static model, even if expertly used, may be inadequate to handle relatively simple dynamic situations. The model suggested in the third section of this paper is an attempt to move to a more meaningful formulation for handling time lags on production and capacity building and for showing the time paths of output in growth models.

II

The changes in economic activity which affect the regional economy may arise either internally or externally; that is, as a result of growth within the region, a shift in the composition of demand in the region or as a result of changes in the level of economic activity in the nation which in turn affect the regional economy. Both kinds of changes are important; a growth in population in the region will raise consumer demand for products and services and will perhaps shift the composition of demand among industries, or it may simply raise the level of demand without changing its composition. The development of a new resource will inject new investment flows into the region; thus engaging the multiplier process with its direct and induced effects on income and employment. Or a change in the federal budget—let us say the expenditures on defense—will most certainly have an effect on the economy of California which has a big aircraft industry, shipbuilding, and many military installations. In fact, almost any change in the gross national product will change the demand for the products of some industries in the region and will, within a short time, have an effect on income and employment and the general level of regional economic activity.

In an open input-output model, all of the above types of changes are covered in one or more of the sectors of final demand. It is common to distinguish in final demand the sectors: household (consumption), producers' durables (part of investment), construction, federal, state, and local government, and exports. All of these are exogenous or external to the main structure of the model. The levels of these sectors must be specified independently. Then these final demands and the coefficients of the model determine uniquely the levels of output required. As the final demands change due to any of the factors mentioned above, the output levels (and hence income and employment) will also change. Thus for convenience in measurement, we may lump all such changes in final demand, without specifying the type of change, and go on to compute the multiplier effects on regional income and employment of any type of change in "external" demand.

The precise character of the change in external demand—whether the result of new investment arising autonomously, new consumption resulting from population growth, etc.—need not be defined at the moment, since the multiplier effects of changes in levels of activity can be carried

out in terms of a unit (one or one million dollars), and the direct and indirect effects of the changes can be evaluated.

When a change in final demand occurs in one or more industries, the immediate impact is likely to be on finished inventories of the product but as soon as production plans can be readjusted, the change will be translated into changes in output. Let us call this direct output change (equals change in final demand) for industry k, Δf_k and let us assume it has the unit value of \$1.00. Now the direct effects on income can be obtained by multiplying Δf_k by the household coefficient for industry k, that is, a_{hk}. This coefficient, it will be recalled, shows the payments made to households (as a sector) in the form of wages, salaries, etc., per dollar of output.

The direct change in output in k will, however, cause the industries supplying k to readjust their own production plans, and these adjustments will set off third- and fourth-order reactions. A cut in output by industry k will thus have both direct and indirect effects on output, each industry both affecting and being affected by the "rounds" of these changes. The direct-plus-indirect effects on the output of all other industries of a change in output by industry k are shown by the *k-th* column of coefficients in the inverse matrix. Define $(I\text{-}A)^{-1} \equiv [d_{ij}]$. Then d_{2k} shows the direct-plus-indirect effects on industry 2 of a \$1.00 change in the final demand for industry k. Then it follows that the direct plus indirect effects on income of a \$1.00 change in final demand for industry k are given by: . .

$$a_{h1}\, d_{1k} + a_{h2}\, d_{2k} + \ldots . + a_{hn}\, d_{nk} = \Sigma_j\, a_{hj}\, d_{jk}$$

and the direct income effects (for the \$1.00 change) are given simply by the household coefficient, a_{hk}. We now define the "simple" income multiplier as the ratio of the direct-plus-indirect income effects to the direct alone.

$$M_k = \frac{\Sigma\, a_{hj}\, d_{jk}}{a_{hk}}$$

where M_k is the simple income multiplier for k. Such multipliers have been computed for each industry in the regional input-output models of Utah and California; they are shown in Table 1 together with multipliers computed from a US model for comparison.

Each column of multipliers taken separately can be interpreted without confusion, but comparisons among the multipliers for a given industry in the three models should only be made with the greatest of care. As can be seen from Table 1, the number of industries is not the same for the three models; thus the aggregations which have been performed result in industry classifications which are most difficult to compare. The California model was aggregated from a basic 56 order

model and Utah a basic 26 order model. To what extent the multipliers are sensitive to the changes in the classification system resulting from different kinds of aggregation is not known with any certainty, but the sensitivities are perhaps substantial. In California, petroleum is by far the largest part of the industry, "petroleum and fuels," whereas in Utah coal is larger. Contrasts of the same kind could be made for other in-

TABLE 1

SIMPLE INCOME MULTIPLIERS FOR CALIFORNIA, UTAH, AND THE UNITED STATES

Sectors	Simple Income Multipliers		
	California	Utah	United States
1. Agriculture and fishing	1.66	*	§
2. Mining...	1.25	1.15	**
3. Petroleum and fuels	1.83	1.41	2.12
4 Processed food	3.32	2.39 }	4.45
5. Textiles and apparel	1.55	†}	
6. Lumber, furniture, paper	1 68	†	2 08
7. Other manufacturing	1.72	†	3.40
8. Primary metals, foundries	2.21	‡	2.54
9 Fabricated metal products	1 75	†	2.29
10. Nonelectrical machinery	1 63	†}	2.03
11. Electrical machinery	1 70	†}	
12. Transportation equipment	1.63	†	2.72
13. Utilities	1.04}		††
14. Trade	1.21}	1 25}	2 62
15. Services	1.43}	}	

* Included with processed foods

† In the Utah model these industries were lumped under "Other manufacturing" with a value of 1.44

‡ In the Utah model this was split into two industries with multiplier values as follows: iron and steel, 2 52; nonferrous metals 8.11.

§ Included with processed foods, textiles and apparel.

** Split and included both in primary metals and petroleum and fuels

†† Included with petroleum and fuels.

SOURCES: The California figures are from an unpublished input-output study by the writer and Dr. James Petersen, of the RAND Corporation; the Utah figures are from a paper, "Regional Analysis: An Interindustry Model of Utah," by the same authors and soon to be published in the *Review of Economics and Statistics;* the US figures are from a model basically representing an aggregation of the 1947 national interindustry model. All three models are in 1947 dollars.

dustries, so that the economic meaning of comparisons of the multipliers may be greatly vitiated.

There is one explanation for the differences between the state and US multipliers which is at least consistent with the observed numerical results. For every industry in Table 1, the multipliers applicable to the national model are larger than for the corresponding figures for Utah and California, and in virtually every case the difference appears to be substantial. It is reasonable to explain the lower values for the states as due to the leakages which occur in the purchase of goods and materials as successive industries readjust their output. There are a num-

ber of products which Utah and California do not produce or do not produce in sufficient quantity to satisfy the demands of other industries in the state as the general level of economic activity increases. Even when a decrease in activity is experienced it is not certain that imports will suffer the most since the state industries may not possess cost advantages. Imports and exports bulk larger in the states' economies than in the nation's. If output is to be expanded, a part of the expenditures will go for imports, thus leaking out of the receipts and expenditure stream of the state. On the other hand, of course, exports inject new flows of receipts into the state. Whether on balance the leakages occasioned by the imports are larger than the stimulus supplied by exports will depend on the specific circumstances. It is probable that the effects will be different for a general increase in output from what they are for a decrease. In both the Utah and California models, imports seem to be of such importance in the large that the income multipliers are smaller than for the corresponding industries in the US.[1]

A look at the income multipliers for a state such as California reveals some interesting things. The larger the multiplier, the greater is the relative impact of that industry on the economy of the state, and conversely the closer the multiplier value is to 1, the smaller is the relative effect. In California, the processed food industry with a multiplier value of 3.32 and the primary metals and foundries industry with 2.21 have the greatest relative impact. In Utah, the nonferrous metals industry with a multiplier value of 8.11 is by far the most important to the economic health of the state. These multiplier values have a simple interpretation. In California, if output in the processed foods industry drops in such a way that direct income payments are cut by 1 million dollars, the effects of the cut in production would result in California income dropping by 3.32 millions in total. The indirect effects account for 2.32 million dollars of the total.

We must beware, however, of confusing the relative impacts, which these multipliers measure, with the absolute impacts on income of any given industry. In some industries wage and other income payments are a larger percentage of total cost than in others; so that output need change smaller amount to account for a $1.00 change in direct income payments. Furthermore, we have not said anything about the sensitivity of output to change (i.e., the frequency of change) nor the expected

[1] In his study of the Pacific Northwest, Paul Simpson derived a formula for a static regional multiplier which leads to smaller values than for the nation. The formula is $m = \frac{1 + q_c}{q_s + q_c}$ where m = regional multiplier; q_s = marginal propensity to save; q_c = ratio of imports of consumption goods to home produced consumption goods. Cf. *Regional Aspects of Business Cycles and Special Studies of the Pacific Northwest*, a study prepared for the Bonneville Administration, June, 1953.

amplitudes of change in unstable conditions. Both the frequency and the amplitude of change in output in the cycle are important measurements to consider when assessing the absolute impacts of a change in production in a given industry on the state's income.

It will be noticed that Table 1 is labeled "simple" income multipliers and for good reason. There the initial changes in final demand were translated into the direct-plus-indirect effects on income via changes in industry output. No other relationships were admitted to the calculation. But as incomes change, consumer expenditures on goods and services will ordinarily change also. Since consumer expenditures are one sector of final demand, the changes in income described above will lead to changes in final demand (i.e., consumer expenditures), and that in turn will set off a second round of readjustment of output, of income, and back again to final demand for the third time and so on to fourth, fifth, and later rounds. This circular flow of adjustments in final demand, output, income and back again can be carried through directly via an iterative procedure in the manner just described or the consumption-income relationship can be incorporated in the structure of the input-output model by augmenting the original inverse matrix by the household row and column. If this is done, the coefficients in the household row of the augmented inverse show the total effects on income (that is, the direct, indirect, and induced effects) of a \$1.00 change in final demand for each of the industries in the model. What has been added by this procedure are the effects on output and income induced via the consumption-income relationship. This relationship may be linear and homogeneous or may be of the more usual form, linear and nonhomogeneous: that is, of the general linear form $a + bx$; b, as the marginal propensity to consume, can be used in the household column of coefficients with which to augment the original inverse and the values of a remain in final demand as a stipulated amount of consumption expenditure. Income multipliers of this sort have been computed for Utah alone.[2] As might be expected, the effect of the introduction of the consumption-income relationship is to raise all the multipliers.

We might now relax the conditions of the problem to admit one more type of relationship: the effects upon investment induced by the changes in income and consumption. This calls for a calculation of accelerator coefficients for the region, but it also does more than that. We should have to predict, for given time profiles of production associated with given bills of goods, the division between the additions to demand satis-

[2] Cf. forthcoming articles on "Regional Analysis: An Interindustry Model of Utah," *op. cit.* In that paper employment multipliers are derived as a supplement to the income multipliers. They are of interest in themselves, but the technical problems of their derivation are similar to those for income multipliers so that it was felt that they could be omitted from discussion here.

fied from imports from those satisfied by new capacity building in the region. Now we have come back full circle to one of the problems mentioned briefly in the first section of the paper. To get first approximations to accelerator coefficients is easy. The numerator of the formula for the calculation of the income multipliers can be used, but with the capital-output ratios or coefficients substituted for the household coefficients. For industry k the accelerator coefficient would be estimated by

$$R_k = b_1 d_{1k} + b_2 d_{2k} + \ldots + b_n d_{nk} = \Sigma_j b_j d_{jk}$$

where R_k = accelerator coefficient (per $1.00 change in final demand for industry k); the b's are the capital-output ratios and the d_{ij}, as before, are the coefficients in the inverse matrix.

These coefficients can only be interpreted as measuring the amount of capital directly and indirectly utilized per $1.00 of final demand for the given industry.[3] It is possible to argue that these are only average accelerators and that the marginal figures would be quite different. But over and above the difficulty of agreeing on some numerical values, there is the greater difficulty of meshing the various economic events: the initiating change in some sector of final demand; the changes in output, income, and consumption resulting therefrom; the changes in investment induced as a result and the multiplying effects on income flowing from it; and so on and on. An extremely meticulous analysis of each of these phenomena might make some progress laboriously toward a solution, but since time lags and the necessity of choosing the activities to be performed are met at each point, a model structure to handle these problems and to program them efficiently seems essential.

III

The input-output models described above are static, although by a careful dating of each event an analysis of the whole system may be made which does resemble the dynamic situation. Tracing through the effects of an initial given change in final demand, as was described in the derivation of the multipliers, is a step in the direction of dynamic analysis; but it may be possible to include most of these economic events in a model which will determine whether given schedules of final demand over time are feasible and what the efficient programs are. The model structure to be developed will be used to predict growth in the

[3] Accelerator coefficients were computed for the California model. On the assumption that they may have some curiosity value, the following numbers are presented: Agriculture 2.48; mining .68; petroleum 2.47; processed foods 1.63; textiles .72; lumber, etc. 1.11; other manufacturing 1.22; primary metals 1.85; fabricated metals, 1.31; nonelectrical machinery 1.59; electrical machinery 1.09; transportation equipment 1.34; utilities 2.62; trade 1.25; services 1.20.

California economy for 1954-60, although the model may be used for analysis of many problems other than growth.[4]

Let us start with some simple social accounts and ask how current output is divided among these accounts. We shall denote the output of industry i in the time period t, X_{it}, $i = 1,2, \ldots n$; $t = 1,2, \ldots T$. A part of this output will go to final demand which consists of the output taken by private consumers, by federal, state, and local governments, by exports, and by autonomous investment. As we shall see, investment is divided between that which is determined by exogeneous factors (autonomous investment) and that which the model plans itself in order to meet a desired build-up in final demand (i.e., induced investment). The drain on output arising from the former is included in final demand, and, using the same symbols for i and t as before, final demand is denoted f_{it}.

Output of industry i is also required by other industries in the model, first, in order to produce their own current output and, second, in order to build new capacity (i.e., induced investment planned in the model). Demands on industry i on current account by industries $j = 1,2 \ldots n$ are given (per unit of output) by the standard flow coefficients, a_{ij}, and those on capital account by the capital coefficients, b_{ij}. If all industries are considered together, these two requirements are denoted by the matrices, $A = [a_{ij}]$; $B = [b_{ij}]$. Induced investment, to be determined in the model, is denoted m_{it}. Our last account represents that part of output which is not used up in the current period but which is stored for use later and is denoted, s_{it}.

Now let us account for the capacity, c_{it}, which exists in a given industry at any time t_k. It is simply the initial capacity in the industry plus any capacity built in the periods $t = 1,2 \ldots k\text{-}1$ (we shall assume that autonomous investment is zero in this model); this capacity is distributed between the production of current output and that part which lies idle or unused, u_{it}. Thus at t_k initial capacity is equal to output in t_k plus unused capacity in t_k minus the additions to capacity up through t_{k-1}.

The accounts for all industries in the model can now be summarized in two sets of equations. The first subscripts denoting the specific industry will be suppressed and x_t, f_t, m_t, s_t, c_t, and u_t will designate column vectors; together with the flow and capital coefficient matrices

[4] I am indebted to several people for their help in developing this model: to James Petersen, RAND Corporation, with whom I worked, and am continuing to work, on the California flow input-output model; to Harvey Wagner, formerly of the RAND Corporation, with whom I discussed at length models of this type and who developed a short-cut which halved the number of equations in the computation (his technique has great promise for other linear programing models); to William Orchard-Hays, RAND Corporation, who carried out the calculation on the IBM 701.

A and B they constitute the materials for setting down the accounts in the form of difference equations.

$$(1)\quad X_t = f_t + AX_t + Bm_t + S_t - S_{t-1}$$

$$(2)\quad C_t = X_t + u_t - \sum_{t=1}^{t-1} m_t$$

The first set of equations simply accounts for current output, allowing for the storage of output and for the use of output produced in the preceding period. The last two terms thus show the net change in inventories of finished products. The second set of equations relates initial capacity to its usage in current production, that which is unused, and the programed new capacity.

By using the equations above but casting them into a convenient

STRUCTURE OF LINEAR PROGRAMING FORM FOR THE CALIFORNIA GROWTH MODEL, 1954–60

Activities (Over Time)

	X_1	m_1	s_1	u_1	X_2	m_2	s_2	u_2	···	X_T	m_T	s_T	u_T
f_1	(I−A)	−B	−I						·				
c_1	I			I					·				
f_2					(I−A)	−B	−I		·				
c_1		−1			I			I	·				
·		·				·			·				
·		·				·			·				
·		·				·			·				
f_T									·	(I−A)	−B	−I	
c_1		−I				−I			·	I			I

FIGURE 1

linear programing formulation and writing out the form for a series of time periods, the model appears as in Figure 1. Some rearrangement of the terms in the first equation has also been made. The column heading (e.g., x_1, m_1, etc.) denote the activities occurring over time; each of the headings x_1, m_1, x_2, etc., denotes a column vector which is to be premultiplied by the matrices appearing in its own column. If that is done, the equations above are reconstructed. The equality sign appears just after the column vectors of final demands and initial capacities.

From Figure 1 certain potential properties of the model become evident. As it is written there are no production lag times for current output. Output is produced and is available within a single period. The use of $(I\text{-}A)$ in each period shows this to be the case, and for this particular model for which one year is the unit of time it is quite reasonable

to suppose that no lag times are greater than one year. But assume that each period were fifteen days long. Then it would be essential to specify the lag (or lead) times on each input coefficient as well as to date the maturing of output. This can be done easily (if the information is available) by placing the a_{ij}'s with the appropriate leads in the various time periods. To take one example, suppose that of input a_{12}, 40 per cent is required in the first period, 30 per cent in the second, and 30 per cent in the third, and that if that is done, one unit of X_2 matures in period four. Then one column vector under X would contain $.4a_{12}$ in $t = 1$, $.3a_{12}$ in $t = 2$ and so on, with one unit of X_2 in $t = 4$. This splitting of the time period would also affect the storage activities, s_i, since stock piling could occur and be available only after the output had matured.

In this model there is a one-period lag on the building of new capacity, however. The capacity which is ready to produce in t_k must be built (i.e., the inputs must be available) in t_{k-1}. Again it would be possible to have varying lead times on capital and on the availability of capacity. If partial production can be obtained before the new capacity is completely finished, the identity matrices I under m can be modified to show the availability of this partial production. They can also be modified to show the depreciation of capital. In this model capacity built in t_1 is available without depreciation in all subsequent periods, but if depreciation of capital of, say, 10 per cent per year is to be shown the identity matrices I under m would have values of $.9I$ in the third time period and successively lower values thereafter; thus reflecting the depreciation of capacity.

As a final point it should be noted that the flow and capital coefficients, A and B, can be changed in any period so as better to represent costs or production methods through time. The production functions can be modified to show shifts among suppliers, changes in techniques, or increases in efficiency. The capital coefficients can be adjusted to show the marginal costs of adding to capacity in a given industry. However, these changes must be foreseen in setting up the original model since they affect the whole structure.

The California model has sixteen industries, two sets of equations (one referring to current output and inputs; one to capacity utilization), and there are four kinds of activities; hence the original form of the model contained $2nt = 192$ rows, and $4nt = 384$ activities. A computation short cut reduced this to 96 rows and 288 activities, which is the form in which the model is computed. The model is to test the feasibility of certain rates of growth in final demand over the six years. Final demand in this case means consumer demand and federal, state, and local government purchases of final products. Autonomous invest-

ment was assumed to be zero, and imports and exports were specifically excluded for reasons discussed later.

Estimates of final demand in 1953 for each of the sixteen industries were made by starting with the 1947 final demand from the California gross flows study and by projecting forward to 1953, taking into account population growth, shifts in the relative positions of industry, etc. Capacities for the industries in 1953 were also estimated and the final demands and capacities for the model are shown in Table 2. In a short paper such as this, it is impossible to show the matrices of flow and

TABLE 2

1953 FINAL DEMAND AND INDUSTRY CAPACITIES FOR THE CALIFORNIA GROWTH MODEL

Industry	Capacity*	Final Demand*
1. Agriculture and fishing	3722	861.8
2. Mining	215	3.4
3. Petroleum and fuels	1945	245.0
4. Processed foods	4612	2248.7
5. Textiles and apparel	805	481.7
6. Lumber, furniture, paper	1422	151.3
7. Other manufacturing	2300	574.1
8. Primary metals	1002	1.8
9 Fabricated metal products	1708	80.9
10 Nonelectrical machinery	1430	55.8
11. Electrical machinery	1054	76.0
12. Transportation equipment	6559	189.4
13. Utilities	2898	845.7
14. Trade	3884	2664.3
15. Services	8000	6089.9
16. Construction	4000	181.8

* Millions of 1947 dollars.

capital coefficients which were used. Suffice it to say that the flow coefficients were derived from a gross flows table of sixteen industries which itself was a condensation of a fifty-six order table, and the capital coefficients were estimated using the series of input-output studies on capital coefficients as guides. All figures used in the model are in 1947 dollars.

The feasibility of various rates of growth of final demand over the six-year period are being considered in the computation. Seven separate cases in ascending size have been specified, consisting of uniform or mixed percentage increases over 1953. These seven cases are: (*a*) 2 per cent increase in final demand per year for all industries; (*b*) 2 per cent for industries numbered 1, 2, 3, 4, 6, 8, 9, 12 and 5 per cent for industries numbered 5, 7, 10, 11, 13, 14, 15, 16; (*c*) 5 per cent for all industries; (*d*) 2 per cent and 10 per cent for the same respective groups as in *b;* (*e*) 5 per cent and 10 per cent; (*f*) 10 per cent;

(g) 15 per cent. The differential rates of growth for the two groups of industries require at least a passing explanation. A summary appraisal of the industries, gained in part during the course of the projecting final demands from 1947 to 1953, seemed to indicate rapid growth in demand for some industries such as trade, services, and construction, since, with the growth of population in California, these industries which minister most directly to consumers may be expected to experience extensions of their markets at least equal to the rate of population growth and perhaps much more. Other industries which depend on export markets or which are tied to a natural resource might be expected to grow more slowly; that is, the percentage of final demand satisfied by the industry in the state as compared to the percentage from imports might be expected to decline. In this rather labored way, a very rough justice had to be done to a number of factors. The possible combinations of rates of growth between 0 per cent and, say, 25 per cent for sixteen industries is infinite, and some reasonable combinations of growth rates had to be selected. A more painstaking analysis might demonstrate that the rates selected are nonsense, though I believe on first blush that they are at least within the acceptable range.

The model was first asked to produce in all periods a feasible program for 1953, the initial year. By definition such a program exists if the coefficients, final demands, and capacities are accurate. Then the rates of growth corresponding to the first case described above were introduced in the final demand positions of the equations and tested for feasibility. The successively higher rates of growth will be tested until infeasibility occurs for some rate. Then the optimum program for the highest feasible rate will indicate the growth pattern for the state. At the time of writing, only the 2 per cent case had been computed. The remaining cases for the higher rates of growth are still to be tested. For each industry in the model an increase of final demand of 2 per cent per year has been found feasible, and the program of outputs has been determined. The ninety-six activities to be performed are not worth while setting down in detailed tabular form since the 2 per cent case is just an intermediate stage in determining the maximum rate of growth of which the California economy is capable over the period 1954-60, but some general summary of the character of the results may be instructive:

1. Given the final demand and capacities of Table 2, the 2 per cent case required new capacity building in only three industries: utilities, trade, and services. All other industries had sufficient capacity.

2. Because of the existence of excess capacity, particularly in the first two years of this period, stock-piling activities were carried on quite

extensively in many industries. The levels of stock piling attained in some industries were surprisingly high, indicating that for that low a rate of growth there is a great deal of slack, probably too much to represent any real situation.

3. Since new capacity building was at a minimum, industries such as fabricated metals and construction, which feed capacity expansions, had a great deal of idle capacity.

4. Output levels over time have different patterns as among the industries in the model: some output levels rise steadily (e.g., agriculture); some remain constant (e.g., primary metals); some fluctuate up and down (e.g., lumber, furniture, paper).

It seems evident that higher rates of growth than 2 per cent will prove feasible, since excess capacity exists in most industries. Subsequent calculations will determine how high a rate may be obtained. However, the low level of output of some industries such as transportation equipment is significant by itself because of what it implies about our definition of final demand. Only consumers' demand and the demands of government are included, whereas in the input-output study of California a large portion of the output of this industry was represented by "export" demand. Had we included exports in our final demand vector, this idle capacity probably would not have occurred and the programs of output would have been quite different. Our higher rates of growth will reduce this idle capacity, but the situation is really one of having a set of requirements which does not "drive" the model in the way that seems most realistic. We shall have to redefine our final demand in some way to incorporate the important category of exports in our regional growth models.

There is another important variable whose exclusion biases or limits the applicability of the results, and that is imports. The California model really asks what rate of growth is feasible with the resources (capital) immediately at its command; but the import of certain kinds of products such as steel probably will always be the largest part of total demand in the state. The cost comparisons between domestic products and imports, which are so important for the individual industry decisions to invest in new plant and equipment, are missing from the model. If there is a need for new steel capacity and the resources are available, the model will program such building. Now imports might have been included in the model in several ways; by adding them without a constraint on their amount, any rate of growth is feasible. But ask yourself: what sets the limit to imports into a state? It is most perplexing to try to set down the factors limiting imports. Is it limited by public and private savings plus the ability to create new debts, and if so, what

limits the latter? It is obvious that we need some careful analyses of regional money flows, of regional demand patterns, of comparative costs of producing different products, etc.

Imports might have been included as an additional activity in the model and then either an absolute limit put on the total, thus allowing imports to occur freely up to that point, or by the choice of an appropriate price for imports the model might have been computed so as to minimize the cost of imports. Once the model is computed, the shadow prices which automatically emerge can be used to determine whether any new activitiy will be profitable or not. Explorations along these lines will undoubtedly prove fruitful for more sophisticated and realistic regional analyses.

A second factor about whose impact we know very little is the number of periods over which the model is run and the period(s) at which peak demand occurs. If the model had been run over, say, twenty periods with different time profiles of final demand and with peaks for some industries occurring in staccato during the planning period, the programing of capital building and current output might well exhibit great differences from the program for the planning horizon of five periods, and if, at the same time, each period were set equal to a quarter rather than a year we might well believe that each group of four periods (a year) would show marked differences from this particular model. It will be necessary to run a number of calculations on one model, varying some of the parameters each time, in order to determine the effects of these and other factors. Plans have been made by the author and others to run a small (perhaps ten-industry) national model a number of times, varying some of the parameters each time.

Some of the problems which appear to be quite difficult for a regional model would be less so for a national model, and I believe that the model is much better suited to analyze growth or fluctuations in the national economy. I suspect that the limitations imposed by labor availability, imports, etc., can be handled in more realistic fashion for the nation than they can for a state. Part of this stems from the better data and more thorough background analyses made of data on the nation, and part is attributable to the fact that whereas the commerce between states is subject to very few restraints, the commerce between nations is frequently such that it is not too hard to guess how the choices are going to be made.

DISCUSSION

PHILIP NEFF: These two papers provide a number of exceedingly interesting contrasts, due principally to a basic difference between the approaches adopted by the authors. Mr. Krutilla sees the shortcomings of data as so significant as to preclude the quantitative evaluation of any but direct effects of development programs, preferring, apparently, informal appraisals of all secondary or "triggered" development. Mr. Moore, while undoubtedly well aware of the shortcomings of his basic data, obviously prefers to use it to the limit, perhaps hoping the statistical requirements of his model will affect (possibly "fix") the operations of agencies responsible for the collection and publication of economic statistics. My own inclination, in spite of serious doubts that a unique value attaches to the input-output approach (a virtue that I fear some of Mr. Moore's "seasoned" input-output analysts claim), is to side with Mr. Moore. A flight from quantitative measures to subjective appraisal is a temptation to any social scientist. The identification of cause, the appropriate weighting of multiple causes, and the evaluation of multiple effects is certainly discouraging, difficult, and sometimes impossible given the analytical tools and the data now available. But this does not justify recourse to methods or approaches that at best can provide tentative and partial answers to important questions.

Mr. Krutilla rejects the evaluation of regional development programs by comparisons of growth rates of aggregate income series among regions on the following grounds:

1. Other governmental programs, e.g., military procurement, affect regions differentially.

2. It is impossible to establish one set of boundaries within which are confined all effects of such programs.

3. Such an evaluation assumes that all regions have equal development potential.

4. Development programs are relatively unimportant compared with all other influences on regional income. Since it is impossible to abstract from these other influences, income comparisons fail to measure the contribution of such programs.

As I see it, these four limitations add up to the fact that results (income changes) cannot easily be traced to their many causes: resource complement, export demand, military procurement, government investment, etc.

Mr. Krutilla offers as a substitute a method for evaluating the comparison of costs and benefits of those programs of a development agency such as flood control, navigation, and power for which the development agency has exclusive responsibility "and from which direct benefits are largely tangible." Somewhat later in the paper he implies that costs and benefits are readily measurable, too. Cost estimating apparently worries Mr. Krutilla not at all. In fact the market value of the services rendered by the agency is usually measured by the cost of the "most economical alternative method of

providing similar services." The development program's success is then apparently indicated by the extent to which the benefit-cost ratio exceeds unity. My doubts that costs and benefits are tangible and measurable are only strengthened by the author's admonition that expected costs and benefits over the life of the facilities should be compared.

Mr. Krutilla's analysis of the factors affecting the impact of a development program on a region, its effectiveness in increasing the supply of resources, and the characteristics of demand for these resources is certainly interesting, and his emphasis on the importance of demand for a region's output is thoroughly justified. But again I think the analysis is oversimplified. Clearly, the discovery and production of petroleum in Arabia has increased that country's resource supply functions, and oil is a product the demand for which is highly income elastic. Few, however, would argue that Arabia has been blessed with substantial development. Secondary industrial development has been almost totally absent. Certainly such matters as income distribution in the underdeveloped area, the propensity to invest locally, and other factors must be taken into account.

Description of industrial development in the area served by the TVA clearly indicates the tremendous significance of secondary or "triggered" developments, but Mr. Krutilla's rejection of aggregate series as tools for program appraisal leaves these developments to informal assessment. It occurs to me that the margin of error left by such a procedure is far wider than it need be and that it can be substantially reduced by careful use of income series.

Mr. Moore is highly successful in demonstrating that the input-output approach provides an interesting and useful skeleton for regional analysis and in doing so performs an extremely worth-while service. Too often, regional studies lack just such a skeleton. Too often, also, these studies suffer from the absence of reliable statistics, and the examination of Mr. Moore's model makes one wonder if perhaps his study does not put too much strain on the data. One cannot tell from the paper, for Mr. Moore merely confronts the reader with results—a regrettable but necessary procedure where the aim is primarily methodological and limits are imposed on length.

Devotees of this technique, I think, too often, because of persuasiveness and perhaps zeal, oversell their product. Unwary folk are trapped, failing to recognize the shortcomings and pitfalls, and look to input-output as the answer to any problem in economic method. Even if the basic data were accurate to the third decimal place, models based on this approach generally assume unchanging input coefficients. And such an assumption is more than hazardous, especially where many industries have excess capacity and when projections are made more than a very short distance into the future. Mr. Moore, in my judgment, shares this characteristic or failing with many "seasoned" input-outputers. A little more "seasoning" would perhaps not be amiss and might protect unwary regional researchers.

LEON N. MOSES: At the suggestion of this session's chairman, my comments will be restricted to Mr. Moore's paper. I shall attempt to evaluate what I conceive to be the author's two main contributions: his use of static input-output

procedures to develop a series of regional income multipliers for Utah and California; his dynamic input-output model for the state of California.

Mr. Moore's multipliers are supposed to provide an analytical tool by which "to measure quantitatively the effects on specific regional economies of given types of changes." Our evaluation of this tool will proceed in two stages. First, granted the assumptions, are Mr. Moore's multipliers based on a logically consistent model? Second, are the assumptions empirically justifiable? We may state at the outset that the author's static regional model—from which his multipliers are derived—falls short of adequacy on both counts.

There is very little discussion in Mr. Moore's present paper of how his regional income multipliers were obtained. In order to evaluate them properly, reference will be made to the author's Utah Study ("Regional Analysis: An Interindustry Model of Utah," November, 1953) which describes in detail the methodology behind these multipliers.

Mr. Moore's first step was the derivation of a gross transactions table for the state of Utah. This table shows the total purchases by each Utah industry of each good from all regions. It was obtained by multiplying known base period outputs by technical coefficients. However, the author's goal was an intraregional flow table; i.e., a table which showed the purchases by Utah industries of Utah output alone. This required that interregional and foreign trade be eliminated from the main body of the gross transactions table. To accomplish this the author first estimated Utah's final demand (household consumption, private investment, etc.) for each good. Utah's total consumption of each good was then obtained as the sum of intermediate or industrial demand and final demand. At this point, Mr. Moore assumed that his region would resort to imports only to satisfy requirements in excess of domestic capacity and that it would not export any good until domestic requirements were fully satisfied. This permitted him to "determine" imports and exports by subtracting total Utah consumption of each good from domestic production.

The gross transactions table could then be readily transformed into a table of intraregional flows. For industries in which Utah had a surplus, the amount of this surplus was entered in final demand as exports. In industries where Utah had a deficit, i.e., insufficient capacity to satisfy domestic requirements, the consumption by each Utah industry of these goods was reduced proportionately. The amount of the deficit was removed from the body of the gross transactions table and entered into the final demand sector as imports.

From the intraregional flow table thus obtained Mr. Moore derived a new coefficient matrix which we shall refer to as the regional input-output coefficient matrix. Each of its elements has a regional as well as a technical dimension. The coefficients in this matrix indicate the dollar volume which each Utah industry purchases from other Utah industries per unit of its own output. Our author computed the Leontief inverse of this matrix and used it to determine the impact on Utah's industries of changes in the final demand for Utah's goods. After determining the latter, the effect on Utah's income was calculated by multiplying each change in output by the corresponding household input coefficient and summing.

The appropriate question to ask at this point is whether Mr. Moore's re-

gional input-output coefficient matrix can logically be used to determine the impact of an increase in final demand? (We shall not deal explicity with decreases in final demand because the argument is quite similar.) The answer is that it cannot, unless his region has excess capacity in every line of activity. If even one sector has insufficient capacity in the base period, so that the region must resort to imports, then use of the regional coefficient matrix to compute the impact on Utah of a change in final demand involves a logical inconsistency. The reason for this is that the model will predict increases in the output of industries which are already operating at capacity. These increases are, of course, incorrect and—because of the interdependencies—the predicted increases in the outputs of all other industries must also be incorrect, as must the multipliers based on them.

Our discussion so far can perhaps be clarified by adopting a somewhat different approach. The major difficulty with Mr. Moore's static model is that the row elements of his intraregional coefficient matrix pertaining to industries of insufficient capacity are variables rather than structural constants. Their value is determined by the ratio of domestic capacity to total regional requirements of these goods. Since a change in any element of the coefficient matrix will—special circumstances aside—alter all elements in the inverse matrix, the latter is composed entirely of variables. Thus Mr. Moore's model and the multipliers derived from them do not provide a consistent method of estimating the impact on a region of changes in final demand.

The assumptions concerning imports and exports which underlie the intraregional flow and coefficient matrices are questionable. Given the degree of commodity aggregation used and the fact that Mr. Moore is dealing with a space rather than a point economy, it hardly seems reasonable to limit interregional trade to the disposal of net surpluses and the satisfaction of net deficits. Existing data on interregional commodity flows do not bear out Mr. Moore's assumptions. The above is only one aspect of the author's failure to give full recognition to the problems of regional interdependence. Another is his neglect of the "feed-back" effects; i.e., the impact which a region has on itself via its effect on other regions. Also, Mr. Moore has no way of determining what the impact on his region will be of changes in the final demands of other regions. He requires this as given data.

Lastly, the author himself comments on the fact that his multipliers may appear somewhat low. This is interesting, since they were computed in a novel way which exaggerates their size. Instead of forming a ratio between the ultimate increase in income and the increase in expenditure, as is usually done, Mr. Moore takes the ratio of the ultimate increase in income to the immediate increase. The latter is derived by multiplying the vector of changes in final demand by the vector of household input coefficients. The divisor of the latter ratio is smaller than that of the former, and the multipliers computed on this basis are therefore larger.

We have so far dealt only with the portion of Mr. Moore's paper devoted to static analysis. It is in the section of his paper devoted to dynamic questions that the author makes a significant contribution. The idea of combining dynamic input-output techniques with those of linear programing for determining

a maximum growth rate is both novel and interesting. However, in certain matters of detail the author could make improvements which would render his results more relevant and significant.

For example, Mr. Moore recognizes that a region can import a good rather than expand domestic capacity for its production and that it can reduce its need for additional capacity by cutting exports. Confronted with the difficult problem of specifying some optimum level of imports and exports, our author decided to assume them away entirely. By this device he destroyed the relevance of his work, since his problem became one of determining California's maximum growth rate under conditions of complete autarchy. This is unrealistic in the extreme when applied to an open economy. Moreover, if the region lacks capacity in any industry, then only a zero rate of growth is possible.

Mr. Moore has so far concentrated all of his attention on the limits to expansion imposed by existing plant and equipment. It would seem advisable to take into account explicity the limitations imposed by the nonreproducible factors—labor and natural resources—as well.

FRANK A. HANNA: So long as there are government programs which are either designed to influence the factors affecting regional output or which seek public support on the grounds that they have influenced these factors favorably, the problem of evaluating regional development programs is likely to be with us. Mr. Krutilla has done excellent service, first, in uncovering many of the pitfalls in the noncritical use of "regional comparisons of income relatives" and, second, in showing that specific development programs often may be evaluated more precisely in terms of their effects on a limited range of closely related activities than in terms of their effects on regional income, which presumably reflects all economic activity within a region.

With the rise in income in the southeastern states during the past two decades, it must have been very tempting to the supporters of TVA, to the state development commissions, and perhaps to other government agencies to point to this income rise as a sufficient justification of their programs. But knowing that income in an area has increased during a given period is not enough. We need also to know that it has increased more than would be indicated by some set of expectations that were derived from factors other than the "development programs." Typically, such a set of expectations is provided by the changes in national income. The income materials used are time series. Like most annual time series they are a mixture of secular trend, cyclical changes, and irregular or nonrepetitive changes. Somehow, from this mixture we have to extract secular trend. As both papers point out, it is only in terms of trend that changes in the underlying factors affecting regional output can be gauged. With present techniques, regional trends can only be approximated. At best, some of the irregular factors will remain, though in annual data these are likely to be small. Larger errors can arise from the imperfect exclusion of cyclical factors.

During the past two decades, the upward trend has been delayed only by the minor recession in 1937-38, the reconversion efforts of 1945-46, and

another minor recession in 1949-50. Nevertheless, cyclical forces have been present continuously. Since some industries are more sensitive to cyclical changes than others, the changes in a state's or area's income level for a given change in the national income may be expected to vary in accordance with the area's industrial composition. Rough estimates presented elsewhere (*Review of Economics and Statistics*, August, 1954) indicate that when the effects of national income changes and industrial composition are taken into account, each of the southeastern states, except Mississippi, has experienced an upward trend or favorable structural change, 1929-51. Krutilla's suggestion that individual industries be analyzed separately is also effective in eliminating cyclical influences if we can accept the very reasonable assumption that the cyclical forces associated with an industry on a national basis operate wherever the industry is found. However, when it is necessary to combine the trends for several industries, the question of appropriate weights becomes important. Use of the levels at either the beginning or the end of the period as area weights ignores differential growth of the industries. Moreover, the absolute levels of an industry in an area are the product of cyclical as well as secular forces. An industry's income, as a percentage of income originating, varies over the cycle as well as secularly. For the nation, this can be handled by averaging. But for a subarea, the averaging of relatives tends to confound cyclical and secular forces. To the extent that Mr. Moore's analysis is based on values rather than physical quantities, it suffers from the fact that the relationships he uses are based on one point in a cycle, 1947, and we might expect value relationships to vary over a cycle.

Mr. Krutilla takes a very pessimistic attitude toward the estimated error attaching to income estimates. No one knows what the errors in national income are. Consequently, they cannot assert that it is impossible for the regional distribution of errors to be as outlined in his extreme example. On the basis of what is known about the compilation of basic data, however, many would expect a more charitable distribution. The Morgenstern estimate of 10 per cent error, which he cites, is based on Kuznets' estimates in *National Income and Its Composition, 1919-38*. A careful reading of the original source shows that this is an estimate of the maximum error probable and that it applies only to the level of national income. The Commerce Department, in its *National Income, 1954 Edition* (page 66), recently stated that the levels "are subject to only a small percentage of error"—one gathers in the neighborhood of 1 to 2 per cent. There is room for larger errors in state income levels. But the error in the level tells us little about the error in the changes in national income or changes in regional income relatives. Would we not expect the errors of omission or commission in compiling the basic data used by income estimators to be of about the same magnitude each year? And would not the same errors be made in allocating income among regions? Even if the error component—the difference between the "true" and the estimated figures--behaved quite differently from the estimated figures, the error in the year-to-year changes from this source likely would be negligible.

I should now like to question whether the introduction of the "terms-of-trade" concept adds anything important to what is already provided by in-

dustry classification. Does a Midwest shoe factory have different terms of trade than a New England shoe factory? It is possible that it may have. It may, for example, be one of the sources of intraindustry dispersion in such measures as average production-worker earnings or value-added per employee. Certainly, industry could be expected to give rise to within terms-of-trade dispersion. Industrial composition seems to be highly correlated with income at the state level. If regional terms of trade are reflected by regional industrial composition, Occam's Razor would seem to indicate that we use existing industrial data rather than spending our efforts trying to create data suitable for terms-of-trade analyses. Agriculture may be an exception; primarily because little effort is made to classify farms even by the seven inadequate three-digit and four-digit categories provided in the *Standard Industrial Classification Manual*. Even in this important major group the provision of adequate categories and intensified efforts to classify farms in greater detail appear more promising than trying to analyze regional farm commodity production for the implied terms of trade.

Perhaps it is no accident that both Krutilla and Moore find their more promising techniques nationally oriented. Within a nation effectively without internal trade barriers, with a common monetary system, and with essentially similar legal and economic institutions, one might expect the income of subareas simply to reflect the industrial or occupational composition of the subarea. Indeed, on the basis of 1950 census data on occupations and on 1949 earnings, I have found that occupational composition accounts for about 80 per cent of the interstate differences in average annual earnings. With or without explicit development programs, subarea industrial compositions are undergoing constant adjustments to new economic conditions, either by selective contraction during periods of recession or by the development of new capacity during periods of full employment and national growth. Whether, at any particular moment, it is better to locate new capacity in subareas where resources are underemployed, as evidenced by low incomes, or to expect underemployed resources to seek higher incomes through migration will certainly vary by industry. By proposing to judge development programs which seek to affect this type of decision solely on the basis of the prospects and requirements of the relevant industries, Mr. Krutilla may have dampened some enthusiasm for regional programing, but he has also brought the problem into better focus.

URBANIZATION AND INDUSTRIALIZATION OF THE LABOR FORCE IN A DEVELOPING ECONOMY

LABOR ATTITUDES TOWARD INDUSTRIALIZATION IN UNDERDEVELOPED COUNTRIES

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In the literature on economic development a certain notable division between optimists and pessimists is apparent. This division is highly predictive of disciplinary origin. Economists—representatives of the "dismal science"—are customarily optimistic about economic growth and its social consequences. Anthropologists and sociologists are customarily pessimistic about the possibilities of economic growth and particularly about its consequences. Although possibly these fields attract different personality types—the manic and the depressed—it seems more likely that conventional theory and habits of thought explain the differences.

I. *Some Contrasting Theory*

Theory of Motives and Consequences. Traditional economic theory has not been strongly concerned with attitudes and motives. Human attitudes and motives are simply assumed to be appropriate to rational choice of means effective for maximizing satisfactions as economically defined and measured. Human wants are thought to be essentially unlimited and human nature pretty much the same wherever encountered. A monetary market system co-ordinates the factors of production and allocates rewards, and financial incentives are assumed to be effective in allocating labor. The movement of labor between sectors of the economy is regarded as a function of its differential marginal productivity, which is principally determined by relative states of capitalization, technique, and, possibly, enterprise.

Given these assumptions, such hints of pessimism that economists have about economic growth in undeveloped areas could be expected to center on questions of capital, market organization, and entrepreneurial activity, but not on the willingness of potential workers to work. And since the economist has a normal prejudice toward the view that improvements in levels of production and consumption are consistent with universal human aspirations, he is certainly inclined to optimism about the consequences of economic growth.

Anthropological and sociological theory stands in sharp contrast to this set of views. Attitudes and motives are of more central concern as variables, related to differential positions within any social system. The person is viewed as having been socialized in ways appropriate to differential social roles, to hold values appropriate to group activity and its survival, and to behave in ways that are "irrational" and "nonrational" as judged on economic grounds. Wants are thus viewed as limited and relative to social position. The social system is viewed as strongly resistent to change, in part because of secondary and tertiary consequences of changes in a complex functional network. If these considerations are important within societies, they are even more marked between them. To contrast with the economist's "similarity of human nature" assumption, the anthropologist or sociologist offers "cultural relativity." He is likely to emphasize differences in values and aspirations in space and time, and to be extremely reluctant to assume that Western experience can be used as a guide to behavior in Dahomey, Nepal, or even Peru.

Given these assumptions, such hints of optimism that anthropologists or sociologists have about economic growth in undeveloped areas could be expected to center on the adaptability of economic incentives and organization to traditional attitudes and patterns, and especially on the willingness of potential workers to work. And since the anthropologist-sociologist has a normal prejudice toward the view that bread or all purchasable goods and services are not enough to satisfy human values, he is certainly inclined to pessimism about the consequences of economic change.

These contrasts are, of course, moderately unfair to both professional groups. Many economists, and especially those who have studied labor mobility, the operation of labor markets, and worker behavior, have expressed strong misgivings about the assumptions of traditional theory. Many anthropologists and sociologists, and especially those who have studied the actual impact of modern economic forms in undeveloped areas, have noted the stresses and tensions in traditional systems and the considerable success of the new employment alternatives in recruiting labor.

Theory of Organized Co-operation. The literature on economic development has included very little material on another aspect of theory, on which our two professional groups tend to disagree. There are differing views on the nature of business and industrial organization as related to the attitudes or motives of participants.

Traditional economic theory has little to say on this subject, since labor is viewed as allocated by market mechanisms and the relation between employer and employee the same in principle as any other

economic contract. The productive efficiency of the division of labor has received consistent attention, but the problems associated with the authoritative co-ordination of labor implicit in factory organization remain relatively unexplored. Only in Marxist economic theory and, more recently, in attempts to construct alternative theories of the labor movement and management-union relations have variables such as power and group loyalties been considered.

Traditional anthropological and sociological theory also has little to say on business or industrial organization, partly because of a concentration on the structure of society generally, partly because economic organization was thought to be the proper province of economists. Only in Weberian sociological theory and, more recently, in attempts to treat "the factory as a social system" have variables such as the authority of office, communication systems, and "informal organization" been considered.

Despite the recent and still somewhat peripheral attention given industrial organization in the disciplines we have been comparing, some differences between the disciplines can be detected. There is a notable tendency for the economist to emphasize—and exaggerate—individual, competitive aspirations, and an equally notable tendency for the anthropologist or sociologist to emphasize—and exaggerate—group, co-operative aspirations. If the economist's model of behavior tends to be the prize fight, the sociologist's model tends to be the quilting bee.

II. *Some Empirical Evidence*

Faced with such contrasting views of economic behavior and its motivational sources, the analyst may be forgiven some confusion and permitted to seek refuge in the data. Unfortunately, evidence has not been collected or analyzed in ways that permit a clear resolution of theoretical disputes. It is possible, however, to get some leverage on the issues by reference to the reported experience in the recruitment and utilization of labor in undeveloped areas.[1]

Apathy and Opposition. A considerable body of evidence runs contrary to the notions that human wants are unlimited, that financial incentives will transfer labor from nonindustrial to industrial pursuits, and thus that the potential worker may be viewed as welcoming release from traditional restraints. Some of this evidence can be interpreted in terms of "rational conduct," but not in terms of economic maximization. The potential worker in undeveloped areas is typically required to give up traditional forms of organization and reciprocal obligations

[1] This section represents a selective summary of a rather extensive discussion, with citations to the literature, in Wilbert E. Moore, *Industrialization and Labor* (Cornell University Press, 1951).

that have combined to afford him security—both material and affective. The kinship system in any nonindustrial society is likely to provide a major barrier to individual mobility, because it is a social security system, because it is the focus of positive values and advantages, and because extended kin obligations are likely to reduce the effective appeal of individual rewards. With an extended kinship system, if the individual faces adversity, his kinsmen are obliged to come to his aid. If he prospers, he is obliged to share his good fortune with great uncles and second cousins once removed. Industrialization breaks up such units, by geographical separation and more importantly by social separation.

The other side of the coin (an inappropriate metaphor in its connotations) is the lack of appreciation of the new status system. This may take the form of a relatively low and highly particular appeal of wages, often commented on with reference to "native" laborers, but also commented on by preclassical writers in economic theory with reference to workers in the early stages of the Industrial Revolution. The principle bears extension, however. New occupations simply do not fit traditional standards of prestige, or are valued negatively because they involve manual labor and merit placement irrespective of age, kinship position, caste, or other forms of "ascribed" status. To the extent that the potential worker operates as an independent producer, the change to wage labor involves some loss of "freedom," even if it offers higher rewards. To the extent that the potential worker operates as the equivalent of a craftsman, the change to factory employment is likely to involve a loss of socially recognized skills, of "workmanship," in the division of labor and its subordination to machine processes.

It would be hard to deny that a considerable part of this apathy and opposition is "reasonable," but equally hard to deny that its explanation lies partly in social standards and values that are badly served by wage incentives and by industrial forms of labor allocation.

The Force of Circumstances. If wages have a limited appeal to nonindustrial populations and new employments are negatively valued, it is not surprising that workers are more commonly "pushed" than "pulled" into modern forms of economic activity. Much of the "push" is in fact the largely unintentional consequence of external intervention. The successful attempt to reduce mortality has the effect of deteriorating man-land ratios, thus increasing agricultural underemployment and causing the landless and impoverished rural dweller to seek and accept other means of livelihood. The introduction of cheap manufactured goods may well displace the handicraft worker and make available an additional pool of workers, either directly or through increased dependency on agriculture. Even the trader may be displaced by large-

scale distribution, or simply by more efficient organization of established markets.

The coercion of hunger does not exhaust the available pressures. Direct political coercion also has an extensive record, ranging from forced labor to the indirect coercion of taxation—a system which has been widely used as a device in colonial Africa.

Not all of the sources of pressure on the potential worker are so clearly external in origin. Any society exhibits some degree of tension and strain, some evidence of dissatisfaction. The presence of new alternatives may allow the deviant who seeks to evade the sanctions of the traditional order to escape from unwanted and oppressive controls.

Again it would be hard to deny that the attitudes implicit in these types of behavior are reasonable and again equally hard to deny that they do not correspond to notions of high sensitivity to slight differences in incentives and opportunity.

The Efficacy of Positive Inducements. Not all of the empirical evidence involves such negative attitudes toward industrial labor. Wages do have an appeal, particularly if they can be used for goods and services that form part of traditional patterns of consumption and traditional modes of relationship. The transitional forms are many, and often oddly at variance with Western conceptions of market operation. The African from the native reserve who works long enough in the mines to pay his hut tax is presumably not highly integrated into a market system. He becomes slightly more integrated when he uses wages to buy cattle for use as a bride price, but this still has a distinctly exotic flavor. His behavior fits our standard conceptions better when he proves interested in all sorts of commercialized goods and services, but of course by then he is likely to have little in common with the values of the preindustrial community.

In some places other inducements to work seem to have operated, although not necessarily in the absence of financial incentives or contrary to their economically expected effect. Patriotic motives and other collective goals have formed the basis of appeals to workers in most industrial societies, with what effect it is difficult to say precisely. Certainly it is likely that a sense of voluntary participation in a worthwhile common enterprise offers some source of satisfaction to workers, although the standard forms of productive organization are not well adapted to making the use of such appeals very convincing. Here, it may be noted, is a possible positive role for union-type organization. Certainly the communists have attempted to involve workers in undeveloped areas in the organized building of the new as well as the destroying of the old forms of social allegiance and power.

III. *Toward a Tenable Theory*

The discussion to this point implies the rejection of two extreme theoretical positions, both of which constitute alternatives available in the literature. The one extreme may be attributed to economics, although by no means all economists would subscribe. To traditional economists, labor attitudes are simply unproblematical, as they are adequately subsumed under the assumptions of maximizing want satisfactions. The other extreme may be attributed to anthropology, in the same unrepresentative sense. To the anthropologist labor attitudes are so problematical, because they are so conditioned by variable cultures, that no other general statement about them is possible.

The attempt to formulate here the elements of a low-order theory rests upon the assumption that it is possible to give a general characterization to the undeveloped areas, to specify some of the crucial characteristics of modern economic organization, and to indicate some of the labor attitudes which are significant for transition from one to the other.

The Nature of Undeveloped Areas. Although it is true that cultures differ, and in many ways, it is possible at a higher level of generalization to detect common and essential functions in the organization of society. Every society has provisions and rules for reproduction, socialization of the young, production and allocation of goods and services, adjustment to the nonhuman environment, maintenance of order. It is also possible to detect some common bases in cognitive orientations and values. All societies encourage some material aspirations (although not necessarily expanding and competitive), some rational, technical orientation to the use of the environment (although not necessarily innovative), and some positive value on health and length of life.

There are internal sources of tension and strain in all societies. The model of the perfectly integrated society is a useful analytical fiction for many purposes but ought not to be confused with primitive or agrarian societies. The sources of strain include, at least, uncertainties in socialization from generation to generation, chance innovations, and competing role demands given scarcities of time, treasure, and energy (or affective loyalty).

All undeveloped areas have already been disrupted in some form and degree by the "external" influence of Western patterns. The consequences of this interference may or may not be favorable to continuous economic development, but this will depend in some measure on the strategy adopted in view of the situation, as well as on the probable effects of influences so far.

One negative generalization is also negative in its implications for

labor attitudes toward industrialization. Mobility on the basis of individual performance is generally not markedly present in undeveloped areas and does not generally form a part of the positive value system. Whether for the individual or for the system as a whole, continuity and not change is likely to be the major value.

The Nature of Modern Economic Organization. It is now commonly recognized that modern economic enterprise depends upon a complex institutional structure. For purposes of simplification this may be partially summarized as a monetary-market mechanism for allocation of the factors of production and for achieving distribution of goods and services. For the nonhuman factors of production this involves at least transferable property rights and rational cost accounting. For the human factors of production this involves a wage system for putting into the hands of the specialized worker a medium for commanding the necessary and appropriate goods and services for himself and his dependents.

Although part of the division of labor will be co-ordinated by impersonal market mechanisms, the fixed capital and economies of scale in the productive unit characteristic of industrial organization imply also administrative co-ordination and the development of scales of authority.

If labor is to be rationally allocated and optimally utilized, it appears essential to select on the basis of technical competence, to co-ordinate on the basis of relationships specific to the interdependent tasks, and to tie rewards to types of activities. These rewards need not be exclusively financial and indeed rarely will be. All of the rewards imply a system of social ranking closely related to position in the productive system.

The Nature of the Transition. Whether one looks at undeveloped areas or the most highly industrialized ones, a fundamental theoretical point is evident. That point is the great complexity of human motivation. Men will work for as many reasons as there are values to be served by such activity and will refuse to work where that serves his values. The fact that industrial systems emphasize values that are commanded in a market and incentives that provide monetary claims on a market should not blind us to the diversity of ends or the diversity of means for their satisfaction.

The effectiveness of wage incentives is relative to the availability of goods and services in the market that form part of the effective wants of workers. This is essentially a common-sense static principle. But it is quite limiting, and failure to recognize it accounts for some of the exasperation of observers of "irrational" natives. The worker in an undeveloped area is typically not accustomed to expect, or even to aspire to, any considerable raising of ceilings on his consumption and

social position. And there are many wants typically not satisfiable by market mechanisms. So we have both limited demand and limited supply.

To translate this principle into dynamic terms, the available evidence indicates that we should expect an increase in demand through knowledge, education, and the development of new values, and in supply through the addition of goods newly available because of industrialization and the movement of services into the market.

This view of market-oriented attitudes can be broadened, with considerable benefit to its theoretical importance.

The effectiveness of the appeal of new employment alternatives is relative to the availability of need-satisfying rewards. This principle will still apply if material or even financial well-being is held constant. The potential rewards include prestige and esteem within an acceptable system of social valuation. This also is a common-sense static principle and is also limiting. The traditional system of social valuation will not typically include the new activities, and the latter compete or conflict with the former. Both change and choice tend to be devalued. If some relationship between wages and markets has been established, higher wage levels can be used as a principal lever on conservative traditions, and this has been their historic role. The private employer is unlikely to act "correctly" in this matter, and this may be a major area for governmental policy in economic development.

Over time, we should expect an increase in aspiration and the addition of values associated with status mobility, merit evaluation, and a realistic sense of choice and initiative. We should also expect new systems of social organization and stratification to which these aspirations and values are appropriate.

Economic growth, insofar as it is affected by labor attitudes, is likely to be radically retarded or contained by any one of several vicious circles. There is considerable evidence of a reciprocal relationship between low wages and low productivity, whether the connection works through mere physical energy or through more subtle frustration and apathy. The failure to detect and utilize convertible craft skills, the assumption that initially unskilled local labor is incapable of training, and the adoption of the "color bar" as an extreme and open manifestation of these practices constitute waste in the short run and possible failure of continued development in the long run.

It appears evident that neither the available skills nor the appropriate attitudes can be assumed to be adequate among the potential workers in undeveloped areas. Growth seems to have been most rapid and most probably continuous in the future where considerable resources have been devoted to formal education and where education and in-service

training have been most closely geared to the skill demands of an industrial economy. Now, clearly, education in many colonial areas has encouraged anything but the development of mechancial and technical skills, and the opportunities for use of any such skills have not been made available to natives. That the new native leaders tend to be political agitators rather than economic administrators is scarcely surprising in view of colonial political and economic policies.

The development of positive labor attitudes toward industrialization would probably be enhanced by the fostering of a sense of social participation as well as by the expansion of individual opportunity and the provision of amenities and security at least equivalent to those available in traditional organization. A sense of social participation has been consistently neglected even in advanced industrial societies. We do not know how flexible industrial organization may be made. But if economic development entails a revolutionary change in the organization of society, as it does, there is at least some theoretical reason for supposing that workers as well as managers or government officials might welcome positive participation in partial compensation for their uprooting.

In view of the complex richness of human motivation, the idea that economic and noneconomic incentives are necessarily competitive for a limited supply is untenable. Both may be increased simultaneously and continuously within very high limits.

IV. *A Methodological Note*

The reason for our interest in attitudes toward industrialization is clear and simple: we want to predict behavior relevant to the industrial mode of production. In stable situations the best predictor of behavior is previous behavior, and attitudes become "intervening variables" in the strict sense. That is, attitudes are necessary but inferential phenomena required to explain the mechanism of action to answer the motivational "Why?"

To predict behavior in novel situations we are likely to want to attach greater significance to attitudes as prime variables. Attitudes may be defined as those psychological attributes of the individual which determine his tendencies to act in specified ways in specified situations. Such tendencies to act involve both a cognitive "definition of the situation" and an affective "evaluation of the situation." Any behavior we are likely to be interested in necessarily involves affective or evaluative components—at the very least, ends and criteria of choice.

Since attitudes are not directly observable phenomena, but some such variable is theoretically required, we are faced with some nasty methodological problems. We infer attitudes from behavior, including

verbal behavior but not excluding other behavior. It is not necessarily true that verbal statements of attitudes are more reliable predictors than are previous relevant actions, if known. The reliability of attitude measures in forecasting subsequent behavior is rather low. But since representative samples of action are often difficult to observe, considerations of convenience lead many social scientists to rely on interview data. If the behavior to be predicted is itself novel, such as reactions to new modes of employment, we are likely to want several indexes of attitudes in the hope of increasing our probabilities. Given a population with some relevant knowledge and experience, personal or vicarious, it is possible that attitudes can be uncovered by techniques ranging from direct questions to projective tests. At best, we are relying on the human characteristics of generalization, transfer of learning, and transfer of values as ways of indicating probable reactions to new situations.

Asking direct questions is, of course, not the only recourse, but it is one appropriate partial procedure. The alternatives, which underlie most of the allegations in this paper, include extrapolation from "comparable" situations at other times and places, and "pure" functional analysis for locating types and degrees of vested interests, sources of tension and strain, and opportunistic and disgruntled elements in the preindustrial situation. Any prediction from any available procedure is somewhat hazardous, for experience is still the best teacher of social scientists, as it is of men.

THE CITY, THE FACTORY, AND ECONOMIC GROWTH

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I

In a generally accepted view, the economic development of underdeveloped countries is contingent upon the introduction of industry. Industrialization, in turn, is associated with urban growth, and the relationship of these two processes is usually assumed to be so close that some writers speak of industrialization and urbanization as two facets of one and the same process.[1] The evidence for the need for industrialization and urbanization is found in the historical experience of the economically more advanced countries and in general considerations on the economic situation of the farm populations in many underdeveloped countries.

The advanced countries contain the most heavily industrialized and at the same time most densely urbanized regions of the world, and to the extent to which industrial cities have grown up in underdeveloped countries, they have been patterned after British, German, and American models.

The improvement in the economic position of subsistence farmers who make up two-thirds or more of the people in many underdeveloped countries is dependent upon industrialization. There are scarcely any underdeveloped countries in which there is not a large surplus of unemployed agricultural labor. This surplus farm labor represents a tremendous waste of human resources and the obvious remedy is the transfer of these "redundant" persons into industry. But their removal from the farms may not always be sufficient and may have to be implemented by removal from the villages to urban areas.

We may conclude, therefore, that industrialization and urbanization are effective means for economic advancement. But this process is not one of unmixed blessings. The social consequences of the growth of industrial urban centers in underdeveloped countries are well summarized by Motwani, when he describes the cities of South Asia as "huge mausoleums of coal, smoke, iron and steel, of dirt and squalor, of overcrowding, of cooly-lines, and human warehouses. Long hours, low wages, bad housing, woman and child labor, infant mortality, accidents, high rents, poor sanitation, prostitution, gambling, racing, dope dealing,

[1] See for example, Kewal Motwani, "The Impact of Modern Technology on the Social Structure of South Asia," *International Social Science Bulletin*, Winter, 1951

dance halls, cabarets and night clubs were features of all the cities. The noise corroded the nerves of the city dwellers, while absence of neighborhood restricted their social contacts and made them strangers to each other." *(Op. cit.,* page 787.)

Much of this is true. But many of Motwani's charges are not the consequences of the growth of cities but rather of general conditions of economic backwardness and poverty. His reproach against urbanization and industrialization is too undifferentiated to be fully effective. Infant mortality is much higher in the rural areas of underdeveloped countries than in their cities; the standards of housing are also, on the whole, rather better in cities; and many of the rural laborers work long hours and receive pitifully low incomes for their toil. Normally the small subsistence farmer works harder and gets less than the factory worker or the workers on plantations, mines, and railways.

But although industrialization and urbanization go usually hand in hand, there is no necessary connection between the two processes. Industries can be and have been established in rural districts and cities have grown up without large industrial plants. The introduction of new technology may sometimes change existing social relations very little and sometimes subvert them completely. The social relations created by modern factory organization, implying new hierarchial relations in the work situation, discipline, the dependence of the worker upon a money wage, the uncertainties and insecurities connected with the proletarian style of life, are not peculiar to urban industry. These same conditions hold in plantations and mines which are typically located in rural surroundings, on railways and other means of transportation, and communication which stretch far out into the countryside. The almost automatic association of industrialization with the introduction of the factory system as it was practiced in the mid-nineteenth century made us forget that the advantages and disadvantages of technological change in underdeveloped countries may be attributed to different factors and that the relative contribution of each of these factors in the over-all process of economic development and technological change must be more clearly determined in order to provide guiding principles for developmental planning. For if certain "undesirable" outcomes can be associated with one factor alone, it may be possible to plan in such a way as to eliminate or at least mitigate the incidence of the undesirable outcome.

In order to isolate the impact of industrialization from that of urbanization, we will examine each of these processes separately. In the subsequent discussion the contrasts and differences will appear sharper than they are in reality. By describing situations which approximate

ideal types, some of the variables are placed in greater prominence than if an attempt is made to present a fully realistic description with all shades and qualifications. I do not maintain that the sharp contrasts which will appear in the discussion are necessarily present in all the developments described. They are emphasized here because by this method attention is drawn to the most important tendencies accompanying industrialization and urbanization in a developing economy.

II

Let us begin with the analysis of "industrial" cities. Firstly, they are new, not merely in the sense that most of them are the product of urban growth of the last 150 years, but rather that many industrial cities arose in places where earlier there had been no places of settlement at all or only small villages or hamlets. Manchester, which has been called the "first industrial city," was described by Daniel Defoe in 1727, as a "mere village." (Daniel Defoe, *A Plan of the English Commerce* [reprint ed.; Oxford, 1928], page 64.) Also other heavily industrialized areas of Great Britain—the Glasgow region, the Newcastle region, the Rhondda Valley, and parts of the Black country—were wasteland or farmland with few and unimportant settlements up to the middle of the eighteenth century. Extensive evidence for the rural character of the Ruhr Valley at the beginning of the nineteenth century was collected by Pierre Bernaerts. He cites accounts of the time which state that the Westphalian region in the 1830's presented "the character of an agricultural country with a few market towns which also had some handicraft trades. No contemporary document envisages by any means the extraordinary upheaval which, in the course of one generation, was to bring forth in this territory the most extensive industrial region of the European continent. . . . Essen is described as an agreeable small town . . . in which in summer the cows were taken to the communal grazing grounds. . . . Oberhausen, Gelsenkirchen and Ruhrort were tiny dots on the map." (Pierre Benaerts, *Les origines de la grande industrie allemande* [Paris, 1933], pages 101-102.) It is superfluous to point out that the great industrial metropolitan centers in the United States, Canada, and Australia grew in places where not even villages had been before the first settlers decided to build their cities in these spots.

The newness of the industrial city—the absence of a long urban tradition with guilds and market privileges and other vested interests—was doubtless an important factor in their rapid rise. Although urban growth in England was rapid everywhere during the nineteenth century, the new cities grew faster and ultimately reached larger size than the older cities. Manchester outstripped Birmingham and Leeds, the cotton

towns of Lancashire overtook the woolen towns of Yorkshire, the coal towns and the iron towns of the north and west overtook the commercial and small-industry centers of southern and eastern England.[2] But although the new cities did not have deep historical roots, they grew up in a cultural environment in which there existed a long urban tradition. They adopted and modified the old institutions, but there was never any question that each of these rapidly growing entities formed a "corporation," a whole of some sort, that the inhabitants of the city were the members of one and the same community, and that they had rights and privileges in the community and duties towards it. Classical liberalism at its height saw some experiments in municipal "socialism" in such fields as sanitary provisions, street lighting, gas and water works, and other services. Municipalities entered the field of education and culture: they built libraries and schools and recreation grounds and parks. In spite of the intense ego-orientation stimulated by classical liberalism in the economic sphere, the older collectivity-oriented values prevailed even in Cobden's Manchester. In spite of slums and low housing and sanitary standards in many parts of the industrial cities, the whole city formed a community. It was not merely altruism or beneficent self-interest which made some municipal reformers agitate for slum clearance and municipal improvement. An important role was played by the sentiment of community; i.e., the conception that any blemish in the city's landscape was a matter of concern for all its citizens.

This sentiment of community became concretized in at least two institutions and types of attitude which persisted thoughout the Western world. One was the tradition of self-government—of the city's taking care of its own present and evolving needs. This found expression in at least some political consciousness and activity of most of the city's inhabitants. The vigorous development of municipal self-government and public services in all Western cities is largely an outflow of this tradition, although it developed different forms in different localities. Secondly there persisted, also, even if in a changing and transformed way, the attachment of the city's population to the urban way of life. This became manifest on the one hand in the clearer distinction between city and country and the city-dwellers' self-consciousness of the differences in their attitudes and objectives from those of the countryside. On the other hand, it showed itself in the development of functionally specific areas in the city itself. The concentric arrangement of modern industrial cities, with their central business districts and their changing belts of industrial and residential areas, the location and function of

[2] On the differential growth of British cities in the nineteenth century, see the forthcoming article by Eric Lampard, "The History of Cities in Economically Advanced Areas," *Economic Development and Cultural Change* (January, 1955), pp 111-112.

district shopping centers, the pattern of intracity communications, and many other features of a similar kind, show the interdependence of all parts of a city upon one another and are proof of the over-all unity of the urban community in spite of its internal wide diversity.

A second common characteristic of the industrial cities in the advanced countries is that their growth was by and large associated with the demand for labor and that people moved to the cities because employment opportunities existed there. This process was made possible by the often rapid growth of industrial investment in the city. Let us again take the example of Manchester, which exhibits this pattern clearly. In 1780 only one factory, that of Richard Arkwright, could be found within the perimeter of Manchester; in 1790 the first Bolton and Watt steam engine was installed in a cotton mill; and by 1820 there were sixty-six cotton, six silk, and six woolen spinning mills in Manchester. By that time factory spinning became unprofitable unless combined with weaving. As a consequence, the manufacturing capitalists were obliged to install the improved power loom and to integrate the spinning, weaving, and finishing processes in one single establishment, each of which employed between three hundred and a thousand workers. By 1845 there were more than a hundred integrated factories in Manchester and Salford. But in addition to this growth of the cotton industry, subsidiary industries were progressing. Machine makers, forges, tin plating establishments, leather workers, braziers, harness makers, as well as railways, canals, breweries, and chemical industries, were clustering around the cotton mills of Manchester and Salford. This expanding concentration of industry called forth a secularly ever increasing demand for labor.[3] As a city grew in population and as subsidiary production developed around each city's main specialized industrial branches, external economies for these main industries increased. Anyone newly establishing a cotton mill in Manchester could count not only on the presence of a skilled and disciplined labor force, but he had suppliers of raw materials, wholesalers to whom he could easily sell his output, sources of credit, repair shops for his machinery, and many other subsidiary services near at hand. This in turn encouraged the further expansion of the industrial base of the city and called for further increase in employment opportunities and a growing demand for labor.

A third characteristic of the industrial city in economically advanced countries is the role it plays in the process of cultural change. Robert Redfield and Milton B. Singer distinguished two phases of cultural change which are mediated primarily by urban centers ("The Cultural

[3] Leon S. Marshall, "The Emergence of the First Industrial City: Manchester, 1780-1850," in Caroline F. Ware, *The Cultural Approach to History* (New York, 1940), pp. 140-143.

Role of Cities," *Economic Development and Cultural Change,* October, 1953, page 59). One is the phase of "orthogenetic" and the other of "heterogenetic" cultural transformation. By orthogenetic cultural transformation Redfield and Singer mean the development of a great tradition, such as took place in the cities of ancient Egypt, China, Mayan Yucatan, and the Christian centers of the European middle ages. Heterogenetic cultural transformation, on the other hand, is a process in which acculturation—the absorption of new culture elements from the outside—takes place and in which predominantly rationalistic tendencies prevail. It is obvious that the growth of the industrial city is a process of heterogenetic cultural transformation. But the industrial cities were not the spearheads in this process but latecomers. The phase of heterogenetic transformation of Occidental cities began with the end of the middle ages, and the "spirit of capitalism" and of rationality were well developed and fully accepted into the pattern of Western social values when the rise of the industrial city began. In other words, the growth of industrial cities took place in a cultural climate favorable to the further development of the technical order in which the modern industrial city could flourish. The industrial city, in turn, soon became one of the chief centers of social change and played an important role in strengthening the new technical order based on rational allocation of resources, competitive markets, and the pursuit of self-interest in economic action.

This development in the value system of the modern world, of which the industrial city is one of the most characteristic symbols, has sometimes been expressed by stressing the presence of universalist, achievement-oriented norms, as against the predominance of particularistic, ascription-oriented norms in less developed societies.[4] This transition in value structures is accompanied by stresses and strains which tend to produce features of social disorganization in various degree. The impact of the modern industrial city, as a latecomer in this transformation process, made itself felt at a time when the basic alteration in social values had already been achieved and its main role has been to reinforce an already existing system of social values rather than to participate in the creation of new ones. Although the industrial cities of the Western countries have witnessed episodes of severe social disorganization, they have been able to overcome these disruptive

[4] The original definition of these variables was given by Talcott Parsons, *The Social System* (Glencoe, 1951), pp. 58 ff. They were applied to the analysis of economic growth in general by Bert F. Hoselitz, "Social Structure and Economic Growth," *Economia Internazionale,* August, 1953, pp. 52-72. The same conceptual scheme was applied to the analysis of the modern industrial city by William L. Kolb, "The Social Structure and Function of Cities," *Economic Development and Cultural Change* (October, 1954), pp. 30-46

tendencies better because they were not places of cultural innovation but rather of cultural consolidation.

III

Before examining to what extent the origins of industrial cities in the underdeveloped countries differ from those of Western industrial cities, we must take a look at one group of Western cities which have performed chiefly other functions than specialization in given branches of industrial production or the supply of specified services. These cities are usually referred to as "central cities."[5] The most characteristic central cities are the capitals of some European countries; for example, Paris or London. They are not only political and cultural centers of their respective countries but also perform some of the central economic functions in the national economies. The money markets, often the transactions with foreign countries, the main wholesale and retail houses, and several important industrial and manufacturing branches are concentrated in these cities.

The history and role of central cities differ markedly from the industrial cities. Central cities—even central cities of only provincial importance—are on the whole older than industrial cities. They developed out of towns which had some political importance already in medieval times, and many of them have tended to perform "central city functions" for a considerable period of their history. Economic growth has been more halting in them, traditions have lingered longer, and their influence has often been on the conservative side. Although some capitals grew as rapidly as some industrial cities, many provincial central cities developed much more slowly.[6] They resisted industrialization more effectively than the newer cities and the influx of migrants into these central cities was motivated not always by search for employment or economic betterment but by expectations of political promotion, or simply the desire to be on the scene where important new events were taking place. The general transformation in the value system has affected the central cities as well as the industrial cities. But in the former the raw edges were somewhat smoothed, extremes were, on the whole, avoided, and the impact of the new economic ethic was less drastic. It is probably no accident that the economic ethic extolling universalist, achievement-oriented norms is referred to as "Manchesterism" and that American sociologists have chosen Chicago

[5] Edward L. Ullman, "A Theory of Location for Cities," in Paul K. Hatt and Albert J. Reiss (ed.), *Reader in Urban Sociology* (Glencoe, 1951), pp. 123-132.

[6] On the different ranks of central cities see especially Walter Christaller, *Die zentralen Orte in Sueddeutschland* (Jena, 1935), and Ullman's discussion of Christaller's schema, *op. cit*., pp. 126-127.

as the model when they wished to describe the specific flavor of the sprawling, big, American industrial metropolis.

IV

If we now compare industrial and central cities in the underdeveloped countries with their counterparts in the advanced countries, we find several rather startling differences. Above all, there are hardly any genuine industrial cities in underdeveloped countries. Though the absolute number of cities with population 100,000 and above is as large in "preindustrial" countries as it is in industrial countries, the very fact that in the former set of countries more than half the males are occupied in agriculture, fishing, or forestry explains the scarcity of genuine industrial cities in these countries.[7] Though such cities as Kanpur or Ahmedabad in India, Maracaibo or Monterrey in Latin America, and Dharan in the Middle East may be regarded as genuine industrial cities, the majority of the cities of underdeveloped countries perform numerous central city functions and industry plays often only a relatively subordinate role. Thus, if Motwani designates the cities in underdeveloped countries as "mausoleums of coal smoke, iron and steel," he can speak only of very few such cities, and even there of relatively limited quarters only. The appropriate counterpart for comparisons with cities in underdeveloped countries is, therefore, not the industrial cities, but the central cities of the advanced countries. But the central cities have shown themselves more stable and more resistant against the introduction of new values. They have resisted, also, to some extent the introduction of industry. They have had fewer upheavals, there was less disorganization, and there was maintained a higher degree and more profound sense of collectivity-orientation than in the industrial cities of the advanced countries. It is the contrast between places like Toulouse, Munich, Edinburgh, or Albany—cities with important central city functions and fair degree of industrialization —and centers such as Dakar, Djakarta, or Mexico which comes under scrutiny.

If we trace the actual origins of the cities in underdeveloped countries, we find that many of them, like the bulk of the industrial cities of Europe and North America, are new. They were founded by foreign traders or invaders; in the colonial and excolonial countries, by representatives of the colonizing power. Some of the cities in underdeveloped

[7] Kingsley Davis and Hilda Hertz Golden have shown in the article, "Urbanization and the Development of Pre-Industrial Areas," *Economic Development and Cultural Change* (October, 1953), p. 9, that of the world's 807 cities with populations of more than 100,000 persons, 463 are located in countries with more than half the occupied males in agriculture and 434 in other countries. The total population of the first group of cities is roughly 160 million; that of the second group, only approximately 155 million.

countries are planted upon the native cities which existed previous to contact with the West. These last cities—places like Mandalay or Benares, Mecca or Fez—have shown most refractory against change and the introduction of industry. They often played an important role in the orthogenetic transformation of the urban culture of the underdeveloped country; they were "sacred" cities in which important traditions of the cultural past of these countries were preserved. They have resisted the introduction of new values and new methods and the Westerners found it often easier to leave these cities as oases of "backwardness and superstition" and to construct their own cities elsewhere. This experience has been made also in tropical Africa. The relatively large settlements of indigenous peoples which existed before the full penetration of parts of West Africa by Europeans appeared to be ideal sites for the establishment of commercial and industrial activities by the colonizing powers. Often these settlements (as for example some of the larger towns of the Yoruba in Nigeria) were situated on favorable spots on rivers or in sheltered bays. There was a large population nearby which offered a potential ample labor supply and housing of a sort already existed in the native town. Hence these towns appeared, on the surface, as the most promising places for economic development. But it was soon found that the very existence of a previous settlement, with all the customs and beliefs which had developed in it and around it, proved a very unsuitable place for rapid change. There were serious rigidities, even revolts. The generalization that a city is, in general, the readiest place for innovation proved fallacious with respect to these towns. The most rapidly growing and most "Westernized" settlements in Africa were not the places with a long urban history but the recent creations of the Europeans.[8] Thus many cities—even in countries with old cultures—are new and, in addition, creations of outsiders. Balandier says of West and Central Africa (an area with considerable urban traditions) that the only city "which has risen to the scale of a great European town" is Ibadan in Yorubaland, Nigeria (*op. cit.*, pages 3-4). All the other cities were founded and built by whites, although they are inhabited predominantly by Negroes.

It is, therefore, not surprising that in African cities a sense of community, as we know it in Western cities, is absent. This does not mean that Africans are not collectivity-oriented. On the contrary, they are

[8] On urbanization in Africa, see the Working Papers submitted at the Conference of Social Scientists on the Social Impact of Industrialization and Urban Conditions in Africa, held from September 29 to October 7, 1954, at Abidjan, Ivory Coast, under the auspices of UNESCO. Cf. especially the papers by Rhona Sofer, "Adaptation Problems for the African Population in a Society of Early Industrialization at Jinja, Uganda," and by Georges Balandier, "Urbanism in West and Central Africa: Suggested Trends of Research" (mimeographed).

more deeply tied to the group to which they feel they belong than Westerners. But the group to which the African is loyal is not the city in which he lives, but his family, his kin, his tribe, his village. African cities are, therefore, collections of many separate compounds. This characteristic of the African city is confirmed by the all too few social surveys which have been made in Africa. For example, Mrs. Sofer writes that the African population of Jinja is heterogeneous and variable (*op. cit.*, page 1), and Balandier prefers to speak of "les Brazzavilles noires," indicating that the various African quarters of Brazzaville are as many separate towns *(op. cit., passim)*. This lack of unity in urban agglomerations is found also in other underdeveloped countries. Redfield describes Mérida of 75 years ago and shows that by that time the various *barrios* formed virtually self-contained independent villages. Though some integration has taken place since that time, many particularistic features still prevail. Pierre George discusses the *bidonvilles* of the cities of French North Africa, and finds there also a high degree of particularism. Finally, and most importantly, the lack of internal cohesion and unity has been found to be characteristic of the cities of India, Burma, Thailand, and Indonesia. In fact in some Indian cities it appears to be so pronounced that some students believe this trend towards particularism to be a lasting feature of Indian urban development.[9]

One of the great contrasts between the cities of the underdeveloped countries and those of the West is therefore the absence of a "city-consciouness" in Asia and Africa and perhaps also in Latin America. This implies, at the same time, that the distance between urban and rural styles of life is less pronounced than in Europe; that the loyalties of the urban dwellers are frequently to groups whose center of gravity is outside the city; that sojourn in the city is regarded often as only temporary; that migrants to the city from one village or province not only tend to settle in clusters of their own but that even when they have become permanent city dwellers they maintain some ties with the region they came from; and that each district of the city forms a community of its own, often rigorously separated from the others. These differences have already been pointed out almost twenty-five years ago by Max Weber. He examined the pecularities of Chinese, Indian, and Arabic cities and concluded that "only the West has known an urban community [*Stadtgemeinde*] in the true sense of the word as a mass

[9] See Robert Redfield, *The Folk Culture of Yucatan* (Chicago, 1941), pp. 25-28; Pierre George, "Bidonvilles, a Form of Urban Development in Underdeveloped Countries" (lecture presented at the International Conference on Underdeveloped Areas at Milan, October 10-15, 1954); McKim Marriott, "Some Comments on William L. Kolb's 'The Structure and Function of Cities,' in the Light of India's Urbanization," *Economic Development and Cultural Change* (October, 1954), pp. 51-52.

phenomenon." (*Wirtschaft und Gesellschaft* [3rd ed.; Tübingen, 1947], Vol. II, pages 523-528, especially 523.)

The consequences of this fact are of considerable gravity. Most of the European migrants to the cities in the eighteenth and nineteenth centuries came from the countryside, just as the migrants to cities in underdeveloped countries today. But whereas the European, once he had reached the city and lived there for a short time was able to cut himself loose from his old home because he found a new home with new loyalties in the city, the Asian or African does not experience such a transfer of loyalty. He continues to "belong" to the place whence he came and he never feels fully and exclusively at home in the city. The migrant to the city in underdeveloped countries lives in a strange and foreign place as long as he remains in the city and this alone increases the psychological stress he experiences. It means, also, that he seeks as associates only persons who come from the same kinship group, village, or province as he himself. In this way almost all interpersonal relations into which he enters are strongly influenced by the pattern of group formation peculiar to his native culture. He works with men who have the same ethnic and often even the same local origin. He lives in a social structure in which authority and responsibility are distributed according to patterns characteristic of his native culture rather than that of the city and its economic needs. His relationships with his fellow-workers, his supervisors on the job, his trade-union—if he is a member of one—are expressions of the culture and social structure of his native environment and not of the city or even of the European model after which they were patterned. It is therefore not surprising that we find among the noncommunist union leaders in South Asian countries two groups, one of which "consists of leaders whose authority is local and based on native traditions" and the other of which, though inspired by Western models, tends to "resort to autocratic measures, making it hardly distinguishable from traditional forms of leadership, except perhaps in its professed ultimate objectives." (George E. Lichtblau, "The Politics of Trade Union Leadership in Southern Asia," *World Politics*, October, 1954, pages 92 and 98.)

The urban environment in underdeveloped countries has therefore the effect of increasing greatly the anxieties and uncertainties of the recent migrant, to make him look for security in familiar surroundings, and to seek out associations in which familiar patterns of social structure, authority, and responsibility prevail. This creates a sentiment of strong ambivalence towards the city, even on the part of those who have come to the city because they were attracted by its glamor and of those who have no place else to go, for whatever reason they came. It further explains why the pushes in order to impel people

to migrate to the cities must be so strong, and why, in spite of apparently appalling conditions in some of the overcrowded rural areas of India, Java, and other parts of the underdeveloped countries, people continue to remain in their villages.

V

And yet we find cityward migrations in underdeveloped countries which are larger than is warranted by the newly created economic opportunities in the cities. Here is another difference between the cities of underdeveloped countries and those of the advanced countries. The rapid growth of the industrial cities of Western countries occurred simultaneously with the rapid growth of industrial investment and hence the movement to the cities was in large part a response to the opening up of new employment opportunities there. To be sure, many migrants had only very dim expectations as to what they would find in the city, but wave after wave of migrants found even fairly optimistic expectations confirmed. Sometimes they had to suffer hardships and deprivation for a period; sometimes they flourished as soon as they arrived. But during the entire growth process of the cities in advanced countries, the expectations of the migrants to find employment and improve their economic position were confirmed in the long run.

The pattern of cityward migration in the underdeveloped countries is different. Some migrants are attracted by the glamor of the city and some by expectations of economic improvement. But most persons who come to the city are pushed out from where they have lived before by events beyond their control. In some cases it may be the rigors of famine and other material hardships which drive people out, in other instances it may be civil war and banditry, but in most cases the forces which succeed in pushing people into the cities are persistent and strong.[10]

The most rapid growth of cities in underdeveloped countries took place in the last few years. Accurate figures are not available for all countries, but we have fairly good estimates for the growth of cities in some countries. Some very interesting estimates of urban growth in Indonesia have been published by W. L. Utermark. He presents a table in which he lists fourteen of the largest Indonesian cities, dividing them into two groups. One group is composed of cities which grew

[10] See Wilbert E. Moore, *Industrialization and Labor* (Ithaca, 1951), especially pp. 48-70 and 94-96. On cityward migrations due to famine, see Owen Lattimore, "The Mainsprings of Asiatic Migration" in Isaiah Bowman (ed.), *Limits of Land Settlement* (New York, 1937), p. 133, and Walter H. Mallory, "The Northward Migration of the Chinese," *Foreign Affairs,* October, 1928, pp. 80-81 (migration of Chinese to Manchuria out of famine-stricken areas in Shantung and Hopei). The main instances of cityward migration as a consequence of civil war and banditry occurred in recent years in Indonesia, Burma, Malaya, and the Philippines.

primarily because of cityward migration from their immediate hinterland, apparently motivated largely by economic opportunities in the city. The other group is made up of cities which grew primarily because people from all over the country hoped to find in the city shelter from insecurity, political advancement, or other opportunities associated with the rapid social and political change of the times. The first group embraces seven cities which in 1930 had a combined population of 536 million and in 1950-51 of 977 million. The second group also embraces seven cities which were inhabited by 1,386 million people in 1930 and by 4,329 million in 1950-51. The rate of growth in the first group was 82 per cent and in the second 212 per cent.[11] This shows that not only are the largest cities growing faster than the smaller ones, but also that cityward movement was considerably more important for noneconomic reasons than for economic ones.

It is not difficult to assess the consequences of this form of development. In the first place, it adds to the insecurity and stress which the migrant to the city experiences. Not only is he torn from his accustomed environment, but he finds that his very existence is put in question in the city. He literally lives from hand to mouth; he is available for any job to be had (including hiring himself out for political demonstrations or rioting);[12] he becomes demoralized and an easy prey for radical agitators of all hues; he lives in unspeakably rotten slums, much worse than those of Manchester in early Victorian times, and scarcely equaled by the *bidonvilles* of North Africa and Spain. A large proportion of the poor people in many underdeveloped towns are not an "industrial reserve army," but a demoralized, unhealthy, pitiful *lumpenproletariat.* Even if a sudden spurt of industrial investment were to take place in these cities, it would be difficult to transform these people into disciplined, effective factory workers.

Another aspect of this recent in-migration is the very high sex ratio in many cities of underdeveloped countries. This phenomenon is not unknown in advanced countries. Among the immigrants from Europe to the New World, men were in the majority, and if we omit persons under eighteen years of age, the proportion of male immigrants increases. Most of these immigrants went to cities, and hence one many say that here was a predominantly male cityward migration. In the underdeveloped countries, also, men predominate so strongly among the migrants that the sex ratios in cities are extremely uneven. For example,

[11] W. L. Utermark, "Aspect économique de l'attraction exercée par les centres urbains et industriels en Indonésie," in *L'attraction exercée par les centres urbains dans les pays en voie d'industrialisation* (Brussels: Institut International des Civilizations Différentes, 1952), pp. 226-234, especially p. 232.

[12] I am told by an American official, resident in Iran, that participation in political rioting—one day for and the next against Mossadegh—was one of the more attractive forms of making a livelihood for a portion of Tehran's *lumpenproletariat.*

in four of the eight largest Indian cities the preponderance of males is very strong. In Calcutta there are 602, in Bombay 569, in Ahmedabad 764, and in Kanpur 699 women per 1,000 men. Similarly, in Africa the male urban population is much larger than the female. In the Belgian Congo, for example, there are 696 women per 1,000 men.[18] In many of the mining camps of the Copper Belt in Rhodesia or the Rand in the South African Union the imbalance is even stronger.

The consequences of these facts are not difficult to assess either. The great preponderance of males means that stable families are rarer in cities than in the country. The men who come to the city are single or leave their wives behind. In the former case they may regard their stay in the city as temporary, since they often come in the hope to make enough money to go back and get married. In the latter case they do not break their close tie with their native village; they are not city dwellers but temporary residents. This situation adds to the instability of the city population in underdeveloped countries. It also adds to the stress experienced by the new immigrants and is one of the chief causes for the prostitution, gambling, racing, dope dealing, and other forms of social disorganization and crime which Motwani notes with so much displeasure.

All these factors conspire to make the large cities in underdeveloped countries highly unsuitable places for the development of new forms of social cohesion and solidarity. Although whatever change in the culture and social values occurred in Asia and Africa did primarily take root in the cities and then emanated from them, the changes that have actually been achieved have been slow and halting, often impeded by the lack of unity, instability, and heterogeneity of the city population. If progress towards universalistic, achievement-oriented social values has been difficult in the cities of Asia and Africa, it is not due to the stubbornness of the people or their "superstitious" adherence to old ways of life, but rather to the very unfavorable conditions under which they have been brought to the city and under which they continue to exist.

VI

It is in the light of this contrasting impact which cities have exercised in advanced countries and now exercise in underdeveloped countries that we have to appraise the industrialization of less advanced countries. The analysis of this aspect of economic development can be short because there exists already a considerable literature

[18] The figures for India are for 1951. Cf. India, Census Commission, *Census of India, 1951* (Delhi, 1953), Vol. I, p. 56. The figures for the Belgian Congo are for 1940. Cf A. J. Moeller de Laddersous, "Attraction exercée par les centres urbains et industriels dans le Congo Belge" (Institut International des Civilizations Différentes), *op. cit.*, p. 192.

on this subject.[14] In principle, we may distinguish three types of impact exercised on a nonindustrial labor force by the introduction of mechanized industry. The first is the need for adjustment to the new environment, and it is particularly in this area that the new urban agglomerations are important factors in the formation of an industrial labor force in underdeveloped countries. The second impact is that of a new technology: the replacement of handicraft work by machine work, the acquisition of new skills, and the co-ordination of the tempo and rhythm of work with the machine rather than the freer and less rigorously structured pace of the artisan. The third impact is the imposition of new social relations appropriate to modern forms of industrial organization: new hierarchies, new social groups, new patterns of authority develop which are strange and often contrary to those to which the new recruits of industry are accustomed. The workers find themselves in situations which in terms of their old culture either have no analogue or which are flatly opposed to the old culture. The high-caste Indian, working side by side in a factory with a low-caste Indian; the mixture of different racial or ethnic groups in a factory who previously held strictly aloof from one another; the congregation of people who previously had known co-operation only on the basis of kinship ties, in a labor union or a sectional work crew in a factory—all are cases in point.

As concerns the impact of the urban environment, little needs to be added to what has been said before. The city in an underdeveloped country is an inhospitable environment for many actual or potential laborers. Reference is made not so much to slum conditions and bad housing, although these have detrimental effects on the morale of an industrial labor force. Nevertheless, in many underdeveloped countries actual health, sanitary, and housing standards are no worse, and often better, than in the rural areas whence the workers come. To be sure, conditions are often worse than they were in nineteenth-century Europe, but compared with what the cityward migrant in many underdeveloped countries left behind, his standard of real welfare suffers hardly any diminution. The inhospitality of the urban environment expresses itself rather by the serious psychological strains it exerts on the worker. Employment is uncertain and wages too low to permit savings for a rainy day. Families are torn asunder; the comforting security of a known and accustomed environment is lost. The number of face-to-

[14] In adition to Wilbert E. Moore's book, mentioned earlier (in note 10) there exists a considerable literature on this topic sponsored by UNESCO, ILO, and various national governments. A good bibliography is contained in Wilbert E. Moore, *op. cit.*, pp. 365-398. Other writings are listed in *Current Sociology: International Bibliography of Sociology*, Vol. I and ff.; and Daniel Craemer, *Bibliography on Income and Wealth*, Vol. II (Cambridge, 1953), especially under the headings "Estimates of Labour Force by Geographic Areas" and "International Comparisons of Labour Force Estimates."

face relationships with persons whom one does not know is increased; the loneliness of the individual becomes, in some cases, almost absolute. These conditions impair morale, discipline, and steadfast devotion to a given task. It is not the noise or the soot in the city which corrodes the nerve of the worker, as Motwani has it, but rather the "absence of neighborhood"—the anonymity and impersonality of life in a big city. These factors go far to explain the high absentee rate, the high rate of turnover, and the low standard of performance of many industrial workers in underdeveloped countries.

The impact of the new technology pales in importance besides this impact of the urban environment. New skills can be learned and have been learned with surprising speed by many peoples. It has been pointed out again and again by anthropologists that the technical manipulations involved in handling complex machines have been learned with relative facility by peoples in underdeveloped countries who had no previous knowledge of these machines and whose general standards of literacy and education left much to be desired. No less an authority than the late Ralph Linton wrote: "I would back certain Polynesian and Swahili mechanics of my experience against nine-tenths of American garagemen for ingenuity and mechanical know-how."[15] The retarding factor is not the incapacity or lack of interest on the part of workers in underdeveloped countries to acquire the requisite skills but rather the inadequate provision for training, the great shortage of educational facilities, and the impediments, in many instances, to advancement which deprive workers of incentives to improve their performance. The "demonstration effect" described by Ragnar Nurkse with reference to changes in consumption patterns of the peoples in underdeveloped countries exercises an influence here also. (*Problems of Capital Formation in Underdeveloped Countries* [New York, 1953], pages 64-65.) Imitation of Western methods and the use of Western machines are recognized as means to increased output and ultimately better living standards. What is absent is not the willingness or human ability to use these machines and methods, but the social institutions which permit their use to these ends.

This leads us to the knottiest and most difficult problem in the industrialization process in underdeveloped countries: the impact of the new forms of social structure and the requirements of new types of social behavior appropriate to large-scale production in the factory. The restructuring of social relations occurs as a result of the mobilization of the labor force implying the imposition of cannons of employ-

[15] "Cultural and Personality Factors Affecting Economic Growth," in Bert F Hoselitz (ed.), *The Progress of Underdeveloped Areas* (Chicago, 1952), p. 78. Linton presents an exhaustive discussion of this point, giving other examples on pp. 77-79.

ment prevailing in the industrial communities of Europe and America. It is hardly necessary to point to the striking differences between the economy in the West and that of most other societies. In the West it is based upon individual effort, whereas most of the other peoples are communally-oriented. Hence in the West the worker acts as an individual. In the economies of most underdeveloped societies, on the other hand, the individual acts usually as a member of a group based on kinship or residence or both. His responsibilities are considered not merely those he individually undertakes, but also those of the other members of the group to which he pertains. Similarly any compensation he may get for his effort is regarded by him not merely as a reward to be employed for his individual purposes but to be shared with the other members of the collectivity of which he forms a part. In many societies there are still recognized traditional arrangements for the control of money income which secure to the older members of the community the major handling of what money income is secured. Laborers must share their income with chiefs, parents, fathers-in-law, or other relatives and persons of respect.[16] In addition to this, the ranking of persons in terms of traditional status relations may differ considerably from that established in a factory work situation. Older men or chiefs or other persons with high traditional status may be subordinate in the factory to younger men, and this subordination may express itself not merely in a lower wage but in actual positions of inferiority in the factory hierarchy or a work crew. The disruptive effects not only on traditional social structures but also on the psychological security of the persons involved are obvious if a man with high traditional status must obey orders of someone who in the traditional ranking is far below him simply because the new distribution and valuation of skills makes this new relation mandatory.

I do not wish to suggest that these changes should be prevented in order to maintain an old cultural tradition or even to preserve certain traditional social structures from disruption or disorganization. I am merely pointing to these changes which, in the light of productive efficiency, may be necessary in the new work situation, in order to explain why the new social relations established in the factory are often contradictory to the traditional and accepted views of a man of himself and his relation to his fellowmen. It is also important to state that, other things being equal, the farther removed the factory is from the locus in which traditional social relations exist, the easier will it be accepted and the fewer psychological or cultural impediments will

[16] A number of such instances are reported by Raymond Firth, "Money, Work, and Social Change in Indo-Pacific Economic Systems," *International Social Science Bulletin*, 1954, pp. 406-407.

stand in its way. A factory located in a village in which the old culture is still strong and vigorous is likely to create more conflict than one located in a far-away city. The more homogeneous, moreover, the labor force in a given factory the more likely will be its resistance against changes in the accustomed patterns of authority and responsibility. (An instance of this is reported by John Useem, "South Sea Island Strike" in Edward H. Spicer [ed.], *Human Problems and Technological* Change [New York, 1952], page 149-164.)

VII

We are now in a position to draw together the various strands of this analysis. The impact of the modern factory is exerted along technological and social-structural lines. The former create relatively few difficulties, but the latter may be a cause of serious maladjustments and resistances reflected in the over-all low productivity of the labor force. These impediments to effective control over the labor force result from the contradictions—which are not necessarily present, but do in actual fact occur often—between the traditional structure of the social status system and the new social relations created by the work situation in the factory. The city, on the other hand, has the definite tendency to break down the old cultural traditions and to weaken the influence of traditional status considerations and interpretations of the worker's place in the social hierarchy. Though residence in a city may create anxieties and stress often bordering on *anomie*, this very same process may produce the result of creating in the co-operation with other workers in the factory an environment in which the new social relations established there may come to be regarded rather as a positive integrating than a disorganizing factor. A recent migrant who feels lonely in the city may welcome the relative security resulting from his being placed in close daily contact with individuals whom he gets to know and with some whom he may become friendly. To be sure, one should not exaggerate the loneliness experienced by many recent migrants to the cities of underdeveloped countries. They usually find some person to whom they are related by kinship ties or ties of previous residence. And if this fails, they get in contact with persons who speak the same dialect and come from the same general portion of the country as they themselves. This enables them to maintain at least a semblance of group relations along traditional patterns. But the closer these group relations are to the traditional pattern and the more intimate the cohesion of this traditional collectivity, the greater will be the difference between the interpersonal relationships in this group and the pattern of social relations in the factory.

This then is the price paid by peasants who come to the city where

they are forced to become industrial workers. The transformation of a predominantly rural society, based on the relatively complete self-sufficiency of a village or a group of villages, into an urban society, based on the interdependence of various portions of a country, is necessarily associated with features of social disorganization. On the sociopolitical level they appear in the form of increased crime rates, imbalanced sex ratios, political extremism, and various other kinds of social maladjustment which usually demand some centrally implemented policy in order to be remedied. On the level of the individuals most concerned, i.e., the nascent industrial workers, this process manifests itself in the increase of stress either due to the new urban environment or the new social relations prevailing in large-scale factory production. In many cases these two sources of stress pull in the opposite direction. If the migrant to the city finds an already established community there in which accustomed intergroup relations prevail, the impact of the new social relations in the factory tends to produce the stress. If he does not find a group in the city resembling those of his home, the loneliness and anxiety which he experiences are the chief causes of stress, and the entry into a new system of social relations in the factory, in a work crew, or a trade-union may be a factor of mitigating this stress.

The persons who in the last few years have swelled the cities of underdeveloped countries do, in a sense, play the role of pioneers. The gap in culture, form of economic activity, and patterns of social relationships which they had to bridge will become narrower for those who follow. But the magnitude of the task and its ultimate importance for the welfare of the total population of underdeveloped countries appear to make these sacrifices justified. It is the toll which a rural peasant society has to pay to become urbanized and industrialized.

DISCUSSION

GEORGE B. BALDWIN: The title of our session can be interpreted in two different ways and this our speakers have done. Professor Moore has selected one of these phenomena—industrialization—and has addressed himself to it alone. Professor Hoselitz, on the other hand, has analyzed the relationship between urbanization and industrialization.

Moore is concerned with the development of a low-order theory of human motivation that will enable us to predict how preindustrial populations will behave in a variety of ways that are significant in determining the progress of their transition to an industrial society. Guarding his rear with a suitable set of qualifications, Moore takes to task both the economists, whose oversimplified assumptions about a universal human desire to maximize limitless economic satisfactions lead them to an unwarranted optimism about the potential rate of industrialization, and the anthropologists and sociologists, whose humility before the facts of psychological complexity and cultural relativity lead them to underestimate the possibilities for development and to be anxious about its individual and social consequences.

After contrasting the motivational assumptions underlying economic theory on the one hand and anthropology and sociology on the other, Moore reviews the empirical evidence concerning experience with the recruitment and utilization of labor in undeveloped areas. In the light of this evidence, he attempts to identify the elements out of which a low-order theory (presumably, at last, an interdisciplinary theory) can be built that will allow us to predict experience with labor recruitment and labor utilization. For a spokesman from a pessimistic breed, Moore offers us a remarkably optimistic theory: although human wants in tradition-bound, preindustrial societies are often limited in the early stages, the evidence suggests that we can expect both wants and, consequently, the supply of labor to expand with the spread of knowledge, education, and the growth of new values. This emphasis on changes in human motivations and aspirations over time—changes which can be accelerated by appropriate policies and practices—certainly makes sense in terms of my own limited research on the growth of industry in South India. Moore concludes with a general plea for the cultivation of a "sense of social participation" among workers in new industrial societies as partial compensation for their uprooting from their traditional mode of life.

Professor Hoselitz is less concerned with model building. He pursues the utilitarian objective of trying to "isolate the impact of industrialization from that of urbanization" so that economic planning can proceed on a more informed basis. We are cautioned that there is no necessary connection between urbanization and industrialization, but Hoselitz accepts the view that economic development will be well served where both phenomena occur together. He then analyzes certain key characteristics of the industrial cities of the West and compares "industrial" and "central" cities in both underdeveloped and

advanced countries. Hoselitz places much emphasis on the historical role of urbanization in confirming and accelerating the spread of those rationalistic, universalistic, achievement-oriented habits of thought on which industrialization depends. Equally important, historically, was the growth of what Hoselitz calls "city-consciousness" (closely akin, I take it, to civic pride) in helping the new urban populations of the West accept their transfer from a rural to an urban environment. This "city-consciousness" or "sense of community" seems to be almost wholly lacking in the mushrooming urban centers of Africa, Southeast Asia, and "perhaps" in South America. The result in these cities is the development of discontented, maladjusted populations that have little unity and that do not transfer their psychological roots to their new environment. As a consequence, these cities are not favorable environments for the growth of those attitudes that seem essential to industrialization.

Hoselitz concludes by summarizing industrialization's threefold impact on a preindustrial labor force:

1. People are forced to adjust to a new environment—a city. This necessarily involves social disorganization which manifests itself, at the social level, in higher rates of crime, unbalanced sex ratios, political extremism, and the like. These maladjustments require "some centrally implemented policy" if they are to be overcome.
2. People must adjust to a new technology. This is the least difficult of the three adjustments and requires mainly an increase in the number of vocational training facilities.
3. People must submit to new social relationships, particularly those required by factory organization. Hoselitz finds this adjustment the most difficult in the whole process of industrialization.

So much for the main papers. There are just three comments I want to make about them.

First, what of Professor Moore's attempt to construct a new low-order interdisciplinary theory of worker behavior? To my mind, this does not come off very satisfactorily. Indeed I doubt that this is the direction in which those of us concerned with economic development ought to push. I say this because of what I feel to be the inherent difficulty of the task: as soon as we try to build a model that will embrace the psychological complexities and cultural differences to which Moore pointed, our model becomes so abstract and qualified that it loses all usefulness as a map to the real world. At the end of his paper Moore himself seems to abandon his own proposal for something strangely similar to the economist's (or at least the labor economist's) traditional model of the labor market. However, Moore rightly points out that it may take considerably more time to realize, in an underdeveloped economy, the behavior responses that the economist's model predicts. In short, if we could agree on how long the "long run" is, maybe we would find the economist's model less misleading than Moore initially suggested. In model building, we can substitute time for noneconomic disciplines: the longer the time period, the more narrowly "economic" we can afford to be in our theory.

After all, the theoretical economist's model of human behavior is not very

much farther off the mark when applied to the preindustrial labor market of underdeveloped areas than labor economists have found it when analyzing behavior in the labor markets of Pittsburgh or Detroit. That model has not been found useless, but it has stood in need of adjustment and caution in its use. A similar adaptation seems in order when analyzing the problems of backward areas. Certainly my own attempt to understand Bangalore, South India, as a labor market was greatly helped by traditional economic theory and by familiarity with Western personnel and industrial relations practices. I mention this because it was the similarities, not the dissimilarities, that leapt to mind in comparing these Indian and American labor markets.

Having made my defense of economics, let me hasten to add that the study of economic development does require that economists pay much more explicit attention to the traditional parameters of their discipline. This will inevitably bring them into closer touch with anthropology and sociology, even with anthropologists and sociologists.

My second comment is suggested mainly by Professor Hoselitz' paper. It is the very pedestrian point that we badly need a lot more empirical research before we begin taking our theoretical generalizations very seriously. Hoselitz' paper struck me as first-rate example of the way in which an imaginative and widely-read scholar can stimulate new insights and suggest specific topics for research by giving us some bold generalizations. But he makes many specific statements to which I would take exception. We need to test such generalizations with intensive case studies of industrial growth and urbanization in a number of countries. In doing this, we shall need to break up the phenomenon of "industrialization of the labor force" into many specific problems: labor mobility, vocational training, union organization and collective bargaining, recruiting methods, wage structures and methods of payment, absenteeism, turnover, labor productivity, company welfare policies, promotion arrangements, and so on. Similarly, specific studies on aspects of urbanization are equally required. What evidence is there, for example, that the city planning movement, which is surprisingly strong in some Indian cities, may be able to affect the shape of industrialization in such a way that the less attractive features of industrial urbanization can be avoided and that a sense of community can be developed?

Finally, my third and most important comment is to point out what I felt to be an important omission from both papers; neither lays any stress at all on what I feel may be the most important factor in conducting a tolerable transition from a preindustrial to an industrial society. This factor consists of the attitudes, policies, and skills of employers. I want to suggest that perhaps we ought to hope for and encourage the spread of a specific employer policy that nearly all of us are glad is dead and buried in this country; namely, "welfare capitalism" based on an attitude of paternalism. This implies company housing, company schools, company doctors, company stores and banks (preferably co-ops, as is common in India)—indeed, whole company towns. I would even go so far as to suggest that company unions ought to be formed where no other unions exist.

The spread of such paternalistic practices will bring abuses, of course; but

more often than not the alternative in many underdeveloped countries will be no—or intolerably bad—housing, no schools, no medical facilities, the abuses of the independent moneylender, and no unions. The absence of alternative social arrangements to provide such foundations for industrial communities quickly strikes one even in such a relatively advanced country as India. There would be great difficulties in execution, in potential and real abuses, in stimulating employer concern for such behavior, and possibly in straining scarce capital resources. But I wonder if welfare capitalism does not provide the best hope of minimizing the social disruption and individual anxieties that accompany the early stages of industrialization?

WILLIAM H. KNOWLES: I should like to raise one point in Wilbert Moore's paper, but one that is relevant to Bert Hoselitz' paper as well. It seems to me that Professor Moore too casually sets up a problem of which comes first: a value system which makes a dynamic market economy possible; or a market economy which brings about a compatible value system. When I observed in the West Indies both that natural resources were not being fully exploited and that profit-making opportunities were not being taken advantage of, I was initially impressed with the argument of social anthropologists that the value system obstructed economic development. Further study, however, has caused me to reverse my stand and to believe that social anthropologists have overstressed resistance to economic progress. Instead, I would now argue that the act of setting into motion of technological change will necessarily bring about rapid cultural change.

First, the concept of society in equilibrium is as unrealistic as is the notion of an economy in equilibrium, and both economists and anthropologists are sometimes guilty of confusing their theoretical models with the real world. Change has been taking place in the cultures of underdeveloped areas ever since the arrival of the first explorer, trader, and missionary. The fact is that the societies of the underdeveloped areas are presently in an advanced stage of disintegration and this instability is the very reason why we are concerned with the economic development of such underdeveloped areas. (Dewight Cooke, *There Is No Asia* [Doubleday, 1945], pages 261-262.) The fact that these societies do not seem to be resistant to change by communist infiltration makes the real issue the question of what kind of value system will replace the old.

Second, I believe that the social anthropologists are in error in their observation that what the economist calls rational economic behavior is merely a value judgment and varies from one society to another. It is true that the West Indian peasant behaves rationally when he plants the smallest possible garden close to his door because he knows his neighbors will steal his produce. It is also rational for him to steal from his neighbor's garden. But the peasant community collectively is behaving irrationally when it suffers hunger because of such a "value system." A more likely anthropological term for such irrational economic behavior was used by Madeleine Kerr when she described the behavior of Jamaican peasant communities as pathological. (Madeleine

Kerr, *Personality and Conflict in Jamaica* [Liverpool: University of Liverpool Press, 1952].)

Third, I believe that the problem, in the West Indies at least, is more nearly one of getting a stalled or stagnate economy moving in the right direction than it is one of value systems. Professor Moore pointed out that a vicious circle often develops when employers pay low wages because productivity of labor is so low, and when employees respond by doing as little work as possible because wages are low. Both employers and employees may be considered to be acting rationally, but the resulting low standard of living leads to unstable political conditions of revolutionary proportions. Such a vicious circle is as much a problem in economics as it is one of value systems. From my research in the British West Indies, I would like to list a few specific economic problems to explain attitudes towards work and the resulting low level of economic activity.

Lack of Effective Merchandising. Businessmen do not attempt to create new consumer desires because workers lack purchasing power, and similarly labor is not motivated to work because they do not have unfilled wants. To explain this the social anthropologist concludes that man's wants are not insatiable as assumed by economists. I say that American merchandising methods can make man's wants insatiable even as they are in the United States. An American timber operator in British Honduras explained this to me by saying that industrial discipline is lacking there because the workers were not "hooked." By contrast, workers in Panama have become efficient because they are now hooked, he said. They were caught, he explained, because their wives learned to demand nylon panties and workers had to earn the money to buy such goods. On the other hand, he had just returned from his first visit in twenty years to his home town of Los Angeles and he was shocked by how hard people worked and how much they wanted. They were hooked too completely, he had decided, by American merchandising methods.

Lack of Effective Management. Labor cannot be highly motivated where it is not trained, where supervision is poor, where work standards are slack, and where workers are treated as inferior beings. Low productivity proves to management that workers are indeed inferior and it is therefore futile to attempt modern personnel practices. This vicious circle may be rational or may be part of the culture's value system, but the report of many West Indian workers to the effect that when the boss treated them as though they were dull they played dumb, makes more sense to me.

End of Racial Discrimination. When opportunity for advancement is denied on racial grounds and when wage differentials are based upon color, labor not only fails to be motivated but also indulges in mild forms of sabotage. In this case, however, it is the irrational value system of white Europeans and North Americans that causes the people of underdeveloped areas to resist industrialization and urbanization. There is no color bar in peasant villages and resistance to industrialization may be more of a resistance to undignified treatment common to urban areas than resistance to work or lack of interest in a higher standard of living.

Lack of Capital Equipment. Labor in the West Indies associates work with slavery when it is menial work done with cutlass and hoe. A study by Simon Rottenberg of labor attitudes in Antigua showed that there could be general underemployment while at the same time there was a labor shortage in the cane fields. (Simon Rottenberg and Nora Siffleet, *Unemployment in Antigua* [Labor Relations Institute, University of Puerto Rico, 1952].) Laborers are reluctant to demean themselves by wielding a hoe when they would welcome the chance to drive a tractor. Labor is motivated to work where capital equipment gives relief from backbreaking physical labor and will accept the improved dignity and status that machine operated jobs give over that of field hands.

Substantial Wage Increases for Increased Productivity. It is true that small wage increases tend to reduce the supply of labor through greater absenteeism, but sizable wage increases serve as an inducement to break with the past and assume lower middle-class virtues of hard work, thrift, sobriety, and ambition—exposing the hook to the bait. Professor Hoselitz' description of city dwellers of Asia who failed to acquire the urban value system known in Europe and North American cities was also describing workers whose wages are very low and who are chronically underemployed. Labor prefers work to the leisure of tribal or village life if the compensation is large enough to permit them to assume the urban value system.

Lack of Full Employment. The neoclassical model outlined by Professor Moore also assumes full employment, and behavior patterns are different where there is chronic unemployment. Lack of ambition is frequently lack of job opportunities, and laziness is often an unofficial share-the-work program. My colleague, Professor Anthony Koo, reports that women employees of a new textile mill in a Chinese village quickly broke from parental authority, refused to marry the husbands that had been chosen for them, and demanded that the village stores carry cosmetics and Western clothing. As we have learned in the United States in the transition from depression to prosperity, there is nothing like a job and purchasing power to change a person's values.

Poor Health and Diet. Taking issue with Professor Hoselitz, I believe that an industrial reserve army does exist in underdeveloped areas if workers are made healthy and given a blanced diet. Professor Reynolds' example of the happy Bantu whose value system caused him to prefer leisure to work is probably idyllically descriptive of the fact that the Bantu is suffering from malaria, tape worms, and malnutrition. Thus the Bantu value system is probably based upon physical inability to work. The Republic Steel Corporation was able to exploit the rich iron ore deposits of Liberia, where other companies had failed, by first restoring the native workers to health and then giving the proper food and housing.

Stated in these terms, the worker's attitude toward industrialization and urbanization is not so much a problem of value systems as one of vicious circles which lead to irrational behavior for society as a whole and, in turn, to revolutionary upheavals. In his presidential address before the Industrial Relations Research Association, Clark Kerr stated, correctly I think, that the revolution of the peoples of the world was in favor of industrialization and this creates problems in the rearrangement of social structures. We have the

know-how to bring about the industrialization and we have the merchandising and personnel techniques to overcome the economic stalemates listed above. Our central problem is to keep the manpower and resources of underdeveloped areas from succumbing to communism. The creation of jobs, purchasing power, and a desire for a higher standard of living can be our chief weapons in the fight. Let us proceed with plans for industrialization and the value systems will take care of themselves.

SIMON ROTTENBERG: Messrs. Hoselitz and Moore have written perceptive papers which raise meaningful questions and deal with them meaningfully. In this discussion, I shall not speak of the majority parts with which I agree, but only of the minority parts with which I take issue.

As Mr. Hoselitz correctly says, growth can, and has, occurred in other ways than through industrialization. I think it is true that economies have grown almost everywhere in the world in the last half century. Almost everywhere, income per head of population is larger than it was fifty years ago, and this is true despite the increase in numbers that has also occurred almost everywhere. But industrialization—if by this we mean manufacturing industry—has not occurred everywhere. If people are, on an average, better off now in the Rhodesias, it is in large part because of copper and tobacco; in the Gold Coast, coca; in Assam, tea; in Malaya, rubber and tin; in Ecuador, bananas; in Venezuela, oil; in Colombia, coffee; in Cuba, sugar; in Iowa, corn and hogs; and in Florida, tourism and citrus fruits.

The number of cases in which per capita income increments have been achieved through agriculture, mining, and other nonmanufacturing forms of economic activity is very large.

It is significant, also, that that within the last several decades, in the United States and in Europe, some cities have become "too big." As diseconomies of scale were encountered, entrepreneurs making locational decisions have tended to choose metropolitan area fringes in preference to their centers and, to some extent, small places to large. In the process of locational trial and error, skills have been learned in the administration of decentralized manufacturing that may result in the long run in less congested industrial areas in the poor countries of the world. For both of these reasons, discussion of the functioning of cities in relationship to growth covers less than the whole growth story.

I turn now to the partial case in which growth does occur through the proliferation of factories and where the factories are concentrated in cities.

Mr. Hoselitz says that disproportionate numbers of rural people are attracted to these cities in the non-West, relative to the opportunities that await them there and that these excessive numbers consitute a *lumpenprolctariat* but not a reserve (and presumably efficient) industrial army available to new factories.

We need to ask ourselves here: what is meant by opportunity? People move from place to place in any society for many and diverse reasons. The causes of movement are uniform neither among societies nor among individuals within given societies. But it is uniform among both societies and individuals

that movement occurs because people believe they will be better off if they do move. We are compelled to come to this judgment, if we reject the only two alternative propositions: that people make migrational decisions randomly (as by deciding by the turn of a coin) or that they locate where they believe they will be worse off. I think neither of these is a priori tenable, either for Nigeria or for Tennessee. I have said that people's decisions are consistent with the belief that they will be better off. This does not mean that mistakes are not made. They are; but in the end mistakes are found out and new decisions correct errors in old.

This suggests that, all things considered, if there is movement to the cities from rural areas in the non-West, it will not be larger than "warranted." The incidence of unemployment and mortality in the cities may be high and earnings may be low, but either, even at these levels, conditions are better than in the country or else conditions are worse, but people are willing to pay a price in less opportunity for the specialized services and "glamor" which are available in the cities but not in the country.

Multidimensional motivations for cityward migration characterize movement in both the West and non-West. In both, opportunity-for-income differentials and opportunity-for-nonincome differentials play a part. Can we say which of these two has the heavier influence in each, the West and the non-West?

Suppose we accept, as I think we can, the evidence of both papers that non-Western people are psychologically so thoroughly committed to kin, tribe, and village that they trek to the cities only with very great reluctance, while, in the West, the psychological impediments to movement are less formidable. Then we are led to the conclusion that differences in incomes between the cities and the country must be larger in the case of the non-West to induce movement to cities and, from this, to the corollary that numbers moving cityward there are, if anything, less rather than more than warranted, measured by the criteria of growth and efficiency.

Non-Western city slum dwellers may be poor raw material for the factories, but it is for other reasons than that too many have come to the cities. Relative marginal products of labor in city and country are such that the removal of a proportion of present city dwellers to the country can be expected to diminish total output, not increase it.

In one sense, Mr. Hoselitz is right to say that the learning of new skills by primitives and rural people is done quickly. In the absence of contrary evidence, we can, I think, accept the proposition that the genetic capacity to acquire knowledge is about equally distributed among countries. Where the extent of the market makes the division of labor consistent with cost-minimizing choicing within and among firms, the problem of skill learning even diminishes in magnitude, because simple operations are more quickly learned than complex ones and specialization tends to result in simplification.

I have said that the genetic capacity to acquire knowledge seems to be equally distributed in the world. What Simon Kuznets has called the "*social* capacity" to acquire knowledge, however, is unequally distributed. Some societies are characterized by the experimental acceptance of knowledge, by an

empirical outlook, by skepticism, and by change. Others are characterized by sanctification of knowledge, by a mystical outlook, by traditionalism, and by changelessness. In the former, new knowledge is easily accepted when it proves its worth; old knowledge is easily abandoned when it becomes obsolete. In the latter, new knowledge must struggle to make headway against customarily-verified old knowledge. It is this unequal distribution of the social capacity to acquire knowledge which explains, in large part, why new technology diffuses so much more rapidly among Iowans than among the Bantu. In this sense, adjustment to technology does seem to be something of a problem. Adjustment to technology has still another facet which magnifies the problem. If economies are to grow, knowledge must be used as well as acquired; but the use of new knowledge almost always disadvantages those who use old knowledge. The survival of old firms and old jobholders is threatened by new ones. In economies experiencing relatively rapid rates of growth, old techniques are willing, more or less, to let the market decide which shall pre-empt the field. In relatively stagnant economies, on the other hand, old techniques are often buttressed by public policies which protect old jobholders against new entrants, hold an umbrella over inefficiency, and encourage stagnation to feed upon itself.

In the end, looked at from these vantage points, I think that Mr. Hoselitz may have underestimated the seriousness of the problem of technological adjustment in the poor countries. I think, on the other hand, that he may have overestimated, on net balance, the knottiness of the problem created by the persistence of traditional values in the non-Western cities.

The transmutation of behavior governed by some other rule to behavior governed by the rule of efficiency is everywhere a problem when rural or preindustrial people are taken into the factories. But somehow this transmutation occurs. The economic history of the United States is studded with examples of it. It happened first to the rural women of New England who took up work in the early cotton mills and later to successive waves of immigrants from Europe who somehow accommodated imported values and standards to the requirements of competitive survival in a rational economy in which the market disciplined behavior.

In many respects, our cities were also aggregates of distinct clusters, simulating, in some ways, the cities of Africa and the East of which Mr. Hoselitz speaks. In these clusters, the old standards persisted even into the first generation of American-born of immigrant parents, but efficiency on the job seemed to be achieved, nonetheless. To discuss how this accommodation occurred takes us some distance away from economics and I am sure that I am not competent to pursue it. I venture the guess, however, that the immigrants found it possible to live diverse lives by diverse standards, so that in their homes and neighborhoods they obeyed (perhaps incompetent) elders and on their jobs they obeyed (perhaps young) competents.

I do not want to appear to question Mr. Hoselitz' central thesis that our cities are more efficient producers of rational human animals whose choices among alternatives serve the interests of output and individual gain. I should think, however, that patterns of diversity of values similar to ours can be

found to exist in the non-Western cities, too, and that the factories there breed, for themselves, individualization of contract, hierarchy oriented to merit, and the other structures and values of which Mr. Hoselitz speaks which are the conditions of efficiency. This has, at least, been the experience of the poor countries of the Western Hemisphere where the cities and towns have played a primary role in converting indigenous human raw material characterized by very profound adherence to tradition into a stock of human resources appropriate to economic growth.

I think that some of the detail of Mr. Moore's decription of employment choicing in the poor countries is arguable, but I do not propose to argue it here. His description is closely proximate to truth; in some average sense, in the poor countries people are less mobile and less responsive to price incentives than in the rich countries. Strong loyalties to kin and tribe, low aspiration levels, devaluation of new occupations, and so on cause people to be willing to pay a price for traditional structures and systems.

Certain propositions can be appropriately drawn from this evidence. Other things equal, a community which aspires to consume a small volume of goods and services will produce less than one which aspires to consume a larger volume; a community that wants to consume much leisure will produce less than one that wants to consume little leisure; a community of immobile workers will produce less than a community of mobile workers; a community of workers who are indifferent to income will produce less than one of workers who prefer high income to low. But Mr. Moore goes beyond judgments of this kind, to say that choice patterns in the poor countries make economic theory a useless instrument for understanding the processes by which labor is allocated to uses there. This, I think, is wrong and I propose to devote the remainder of my discussion to this question.

The economic theory of the allocation of labor is an enormously versatile analytical tool. Supply and demand schedules are drawn to show functional relationships between quantity and price. But this does not say that theory assumes that quantity is exclusively responsive to price, nor that response is instantaneous, nor that it is uniform among workers, nor that small price changes will necessarily induce change in quantity.

Textbooks in economics carry graphic illustrations of supply curves of various degrees of slope and there is a long history of literature in the journals on kinked curves and their analytical consequences. If the Bantu prefer to stay on their reserves and if they go into the mines only reluctantly, the supply curve of labor to the mines will be more inelastic than if this were not so. Similarly, the preference of Pennsylvania coal miners for staying in depressed towns after coal has been mined out will tilt the curve upwards.

The number of different degrees of slope of supply curves of labor from infinite elasticity to infinite inelasticity is infinite and the number of different complexes of circumstance which can determine any single degree of slope in this set is also infinite.

The analytical apparatus is broad enough to encompass them all. The extreme case of infinite inelasticity of supply is one in which quantity is precisely completely irresponsive to price; theory comprehends even this case.

The individual supply curve of labor does not even have a persistent slope, but turns and twists in its course. The number of different shapes which it may have is also infinite. The diversity of shapes and slopes which theory permits occurs precisely because of differences among men in aspiration levels and in the evaluation of the income and nonincome properties of different occupations.

The labor supply schedule will be more inelastic if a given increase in the supply of labor can occur only with a large increase in marginal cost and if a given increase in the price of labor makes it worth while for only a small number of new workers to make themselves available for work. The components of cost and of the calculus of what is worth while are many and diverse and they include all of the considerations that Mr. Moore has said—incorrectly, I think—are outside the system of the theory of economics.

Economic theorists never said that relative prices alone determine in which employments people will be disposed to place themselves. When price is measured on the *y*-axis in conventional graphic analysis, the other components of jobs are implicit but not omitted; and theory is versatile enough to admit some other variable than price, either alone or in combination with price, to be inserted instead. If such a substitution should give better predictive results than analysis which functionally relates prices and quantity, then the change can and should be made, but the theory will have been substantially unchanged. Much of what Mr. Moore says about the nature of economic theory is, in the light of what I have just said, not correct.

Economic theory does not assume that men make choices among alternatives which are appropriate to the maximization of satisfactions that are "economically defined and measured," if by this is meant income and only income; nor that "human wants are . . . unlimited," if this means that men are not thought to reckon the cost in leisure foregone, effort spent, and other values sacrificed in satisfying wants; nor that " 'human nature' [is] pretty much the same wherever encountered"; nor that "financial incentives are . . . effective in allocating labor," if this means they do so to the exclusion of other incentives or, again, that costs are not reckoned; nor that workers everywhere are equally willing to work; nor that the preference for lower income occupations over higher income occupations is necessarily " 'irrational' or 'nonrational' as judged on economic grounds"; nor that "Western experience can be used as a guide to behavior in Dahomey," if this means that behavior is the same in both.

I do not want to put this case so strongly that the cause of the criticism of theory will be put out of sight. Theory says that people will be distributed among classes of work such that their marginal products are proportional to their prices. If this is not true at some time or place, then it will pay for people to move from one employment to another until it is true. If it is true, the system is in equilibrium and there is no incentive to move.

Now this is a solution to the problem of the allocation of labor which has a quality of elegance. Everyone knows that competitive equilibria are logical ideals; that no system of natural phenomena ever purely achieves these results; and that the pure theory expresses tendencies rather than describing

precisely what transpires in real worlds and real markets, either in the West or in the non-West.

Elegant solutions are derived because it is the nature of theory, in order to simplify analysis, to be highly abstract, to introduce only a few explicit variables, and to hold others constant or to randomize their effects. The usefulness of theory derives from the capacity of abstract, simple, and unrealistic models to yield results which are highly predictive of real phenomenal experience.

Much of the criticism of theory derives from the belief—which I think false—that simple models cannot be used to explain complex phenomena or from the failure to understand that results that are drawn from these models are only tendential.

From all of this, you will have seen that I dissent a little from Mr. Moore's conviction that economic theory has very limited utility for analysis of preindustrial labor markets. I think, on the contrary, that its utility there is about as great as in industrial labor markets. The insights of economists on behavior in different societies are not different from those of the sociologists-anthropologists. The differences are only in the subject matter of the disciplines.

The economist says: my insight is that Peruvian Indian labor is relatively inelastic to price. He proceeds to examine the factor price and resource allocational consequences of inelasticity, but only some of its causes, such as the cost of training, the scarcity or abundance of natural talent, and the restraints on competition. The sociologist-anthropologists says: my insight is that Peruvian Indian labor is relatively inelastic in price. He proceeds to examine other causes of inelasticity and finds them in values held, kinship systems, family structures, and residential patterns. Their studies are not competitive but complementary.

In any case, I think that the price elasticity of labor in the poor countries is not as low as the reiteration of impediments to mobility would make it seem to be. In all of these countries, there is evidence of movement to cities, factories, plantations, and mines, and from other employments where income is lower. This movement is consistent with the expectation of theory that, other things equal, men will prefer higher income opportunity to lower, and its corollary, that because it occurs, average productivity and average output per head will rise.

Just the other day, Robert Oppenheimer, seeing with profound poetic perception what is going on about him, said: "What is new in the world is the massive character of the dissolution and corruption of authority, in belief, in ritual. . . ." For this discussion, this means, it seems to me, that men now, almost everywhere, pursue higher material levels of life more cheaply in psychic costs than they once did.

MODELS OF ECONOMIC GROWTH

CAPITAL INTENSITY AND ECONOMIC GROWTH

By JOHN H. POWER
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The purpose of this paper is to explore the theoretical possibility of equilibrating adjustments in the capital coefficient in a growing economy. Professor Fellner has recently called attention to the fact that in projections of economic growth this possibility has been largely ignored, leaving to fiscal policy the whole of the problem of correcting any unbalance. Fellner argues that, in an automatically and fully adjusting economy, "the capital-output ratio would always assume the value corresponding to the postulate that all voluntary savings (plus whatever tax payments there are) must be absorbed by the planned private capital formation (plus whatever government expenditures are made). . . . We all know that the economy is not fully adjusting in this sense. But it should not be assumed that the economy is fully nonadjusting in the same sense."[1]

The first section of this paper sets the problem in terms of a crude growth model. It should be emphasized at the outset that this model is not offered as a general model of economic growth, but as a device for concentrating on particular questions in growth theory. In the second section we turn to a reconsideration of the theory of capital intensity. The results therein obtained are applied in the final section to the issue raised by Fellner. Some concluding remarks follow the final section. The analysis throughout pertains to a period longer than a business cycle; and for simplicity we consider a closed, private economy with only two factors: labor and capital.

I

The problem of stable growth is ordinarily posed as that of maintaining balance in the rates of growth of a few aggregates: total demand, the capital stock, and the labor force. The condition for stable growth in this somewhat restricted sense can be stated as follows: potential total output given by the existing labor force and capital stock must be matched at all times by the total demand for output given by

[1] William Fellner, "Long-Term Tendencies in Private Capital Formation," in *Long-Range Economic Projection*, Studies in Income and Wealth, Vol 16, Conference on Research in Income and Wealth, a report of the National Bureau of Economic Research (Princeton University Press, 1954), pp. 301-302

the saving function and capital formation, where the latter is just sufficient to equip increments to the labor force in the optimum ratio.

This is shown graphically in Figure 1.[2] L and dL represent, respectively, the labor force and its annual increment. S, I, and Y are net saving, net capital formation, and total net output, all per annum. The slope

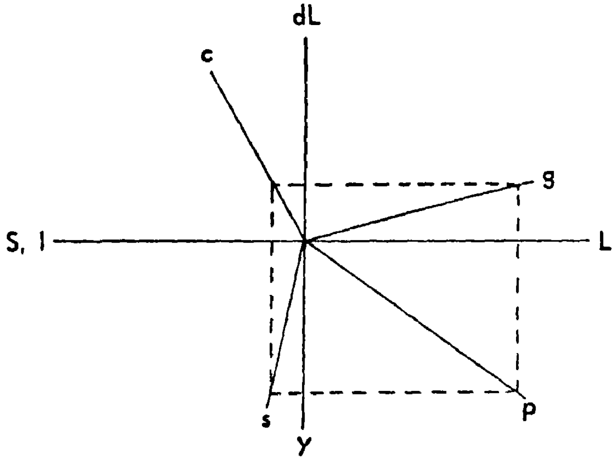


FIGURE 1

of the g function is simply the percentage growth of the labor force. The slope of the c function is the capital coefficient (here stated as a ratio of capital to labor instead of, as is usual, of capital to output). It is assumed that investment decisions are undertaken automatically to equip increments to the labor force in the optimum (most profitable) ratio of capital to labor as given by interest rates, wage rates, and the prices of current output. The stock of knowledge will initially be held constant, and the possibility that a changing pattern of demand will alter the optimum ratio of capital to labor for the economy as a whole will be ignored.

The s function is the saving-income relationship and, together with capital formation, gives the total demand for net output, Y_d. Finally, the labor productivity function, p, gives the relationship between the labor force and the total supply of net output, Y_s, for a given (optimum) capital stock. There is a balanced relationship among the aggregates if Y_d and Y_s meet on the Y axis (alternatively, if investment and saving meet on the S, I axis).

If, however, the rate of growth of the labor force were higher, Y_d would exceed Y_s, resulting in a chronic tendency toward inflation. At the same time there would be rising unemployment (though it might

[2] This diagrammatic representation was suggested to me by Paul J. Wells, of Stanford University.

be "disguised") since a part of each increment to the labor force would fail to be supplied with capital equipment (assuming that forced saving does not equal the total gap between Y_d and Y_s; i.e., that real investment suffers as well as real consumption as a result of the inadequacy of total output).

When, on the other hand, the rate of growth of the labor force is insufficient to require capital formation equal to the flow of saving, Y_d falls short of Y_s and part of the existing labor force is unemployed. If no adjustment occurs in the functions, unemployment grows over time. In the first case, we have chronic inflation with growing unemployment; in the second, we have chronic depression with growing unemployment.

In a general theory of economic growth, we could not simply take it for granted that the atomistic decisions of individual entrepreneurs would provide all increments to the labor force with equipment in the optimum ratio. Indeed, this might constitute a major part of the adjustment problem in an automatically adjusting economy. But an adjustment in the capital coefficient is not the appropriate remedy when unbalanced growth results from a failure of capital widening to proceed at the rate warranted by the growth of the labor force. If, for example, in an otherwise balanced situation, the actual rate of widening fell short of the warranted rate, resulting in a chronic deficiency of demand, a rise in the capital-labor ratio would reduce the deficiency of demand without eliminating growing unemployment. The problem is not solved, that is, by adopting production techniques which raise the ratio at which only a part of each increment to the labor force is being equipped with capital. Thus, the question of appropriate adjustments in the capital coefficient arises only when the adjustment of capital widening to the warranted rate has been accomplished (by automatic forces or government policies). But the question does arise in this case, for the warranted rate may exceed or fall short of saving.

Again, in order to concentrate on adjustments in the capital coefficient, we rule out Malthusian adjustments of population growth to wage changes and classical adjustments of saving to changes in interest rates. The rate of growth of population and thriftiness are the independent variables in the model.

Thus the issue comes down to this: will there occur automatically equilibrating adjustments in the capital coefficient when the growth of the labor force is not consistent with the flow of saving? A certain growth in the labor force will require a certain increase in equipment at the optimum ratio if the new labor is to be employed. This net investment may or may not equal the saving out of the income corresponding to the output produced by the existing (fully employed)

labor force and capital stock. If investment exceeds saving, a fall in the marginal capital-labor ratio would be equilibrating in the sense that it would reduce the excess investment. In the opposite case a rise in the ratio would be equilibrating.

There is a further complication, however. The relation between the labor force and potential output (the p function in Figure 1) is not independent of the optimum capital-labor ratio. Given time, a change in the optimum ratio will affect not only increments to the labor force, but all of the previously existing labor force as well.[8] This means that when the optimum capital-labor ratio adjusts in an equilibrating fashion, the labor productivity function moves in a direction which is disequilibrating! In the case of deficient demand, for example, a rise in the marginal capital-labor ratio will raise investment and total demand; but as the new optimum ratio is gradually adopted throughout the economy the potential output of any level of the (fully employed) labor force is also increased. Only if demand rises more than supply will the adjustment be equilibrating.

Fortunately, however, we can expect the change in demand ordinarily to exceed the change in full employment output, so that, if the shift in the optimum capital coefficient alters investment in the right way, the perverse movement of labor productivity will not prevent the gap between total supply and total demand from being narrowed. This can be demonstrated by considering the case where the optimum ratio of capital to labor is doubled. This will double investment and total demand, but labor productivity will rise in a smaller proportion, provided only that the marginal productivity of capital is diminishing. Furthermore, since we are concerned with net output, we must take note of the fact that the proportion of the labor force engaged in replacement of capital will be higher with a higher capital coefficient. Thus, the rise in net output per worker will be smaller than the rise in gross output per worker.

It is possible, of course, that with the rise in real income per capita the ratio of saving to income will rise and total demand will fail to increase in the same proportion as investment. Offsetting this influence on the saving function, however, will be the change in income distribution resulting from the market forces (e.g., a rise in wage rates or a fall in interest rates) required to adjust the capital coefficient in an equilibrating fashion. For the prospect that labor's share in income will rise is enhanced by the perverse movement in labor productivity, requiring, as it does, a greater rise in wage rates (or fall in interest rates) to eliminate a given amount of unemployment.

[8] It is assumed for simplicity that this adjustment takes place as old equipment is completely amortized. The problems arising from a lack of correspondence between amortization and replacement are ignored in this paper.

On balance, then, it does not seem likely that the shift in labor productivity could be great enough to upset a tendency for the total adjustment to be equilibrating if the shift in the capital coefficient alters investment in the appropriate direction. Hence we will proceed on this assumption. Nevertheless, it should be clear that the tendency will be considerably weakened by the perverse movement of labor productivity.

We have yet to consider, however, just what modifications in the optimum capital coefficient will result from the market forces accompanying unbalanced growth. We turn now to a reconsideration of the theory of capital intensity for the answer.

II

One important result of the capital theory discussions of the thirties was the recognition that the influence of interest rates, wage rates, and prices on capital intensity depends on the nature of the limit to the firm's size. (Wage rates and prices refer to those expected over the lifetime of the investment.) It had theretofore been generally assumed that either a rise in the rate of interest or a fall in real wages, or both, would always reduce capital intensity, while changes in the opposite direction would raise it.

Nicholas Kaldor was perhaps the first to point out that interest rates will be the sole determinant of the firm's capital intensity when its size is limited by the market for its output; but when the supply of capital funds is the limit to expansion, real wages determine its capital intensity and the rate of interest has no influence. ("Capital Intensity and the Trade Cycle," *Economica*, February, 1939.) Unfortunately, Kaldor's results depend on the assumption of complete vertical integration in processes of production. (The assumption of complete integration is a natural pitfall for those who think of capital intensity as an average period of production. This makes Kaldor's adoption of this assumption even more surprising, however, for he explicitly rejected the period of production as a measure of capital intensity.) Furthermore, he was concerned with the capital intensity of the firm, not that of the economy. Changes in the composition of firms can change the over-all capital intensity even when there is no incentive for individual firms to alter their techniques. We shall proceed on the assumption that firms are nonintegrated (i.e., that they buy equipment from other firms and in addition only current labor). It is assumed that the services of equipment and current labor are the only inputs. And we shall take into account the effects on the economy's capital intensity of changes in the composition of firms. Finally, investment is assumed to be a continuous, synchronized process. (Cf. Friedrick and Vera Lutz, *The*

Theory of Investment of the Firm [Princeton University Press, 1951], page 33.)

We shall consider three limits to the size of the firm: sales, labor supply, and capital funds.[4] These, together with four market forces—changes in sales prices, wage rates, interest rates, and equipment prices—give us twelve possible cases for the firm which can be analyzed according to the following three rules: (1) profit maximization implies maximizing profit per unit of the limiting factor ("factors" include labor, capital funds, equipment, and sales); (2) a change in the price of a limiting factor will alter profit per unit of that factor equally for all methods, and hence optimum capital intensity is unaffected; (3) in all other cases, a change in the price of a nonlimiting factor will alter profit per unit of the limiting factor more for those methods which use relatively more of the factor whose price has changed.

All twelve cases are shown in Figure 2, where a zero indicates no change in capital intensity and a plus or a minus indicates, respectively, a change in capital intensity in the same or opposite direction to the change in the price of the factor.

		Limits		
		Sales	Labor	Capital Funds
Changes	Sales Prices	0	+	−
	Wage Rates	+	0	+
	Interest Rates	−	−	0
	Equipment Prices		−	0

FIGURE 2

If, for example, sales are the limiting factor, a change in sales prices will affect profit per unit of sales on all methods equally and cannot change their order of profitability. A change in wages, however, will alter profit per unit of sales (inversely) by a greater amount for those methods using relatively more labor. A rise in wage rates will, then, raise the optimum capital intensity. A change in interest rates or in

[4] Entrepreneurship has sometimes been suggested as the limit to the firm's size. For an effective argument to the contrary, see Tibor Scitovsky, *Welfare and Competition* (Irwin, 1951), pp. 190-193.

equipment prices will affect profit per unit of sales (inversely) more for techniques using relatively more capital. Thus a rise in interest rates (or equipment prices) will reduce capital intensity. The other cases can be worked out in similar fashion.

The crucial question is, then, what limits the size of the firm? This is not necessarily the same thing as asking what limits the growth of the economy. And it is fortunate for the prospect of automatic adjustment that it is not. For if labor supply limited the growth of the economy, for example, the resulting relative rise in wage rates would not induce a change to laborsaving methods if labor were also the limit to the size of the individual firm. The limit to the size of the firm depends, instead, on the imperfections in its product, factor, and capital markets. With no market imperfections there would be no visible limit to the firm's size (assuming proportional returns to scale).

Conceivably the supply of labor could serve as the limiting factor, particularly if the firm required a very specialized kind of labor. These cases are not likely to be quantitatively important, however, in a developed economy. Moreover, both kinds of unbalanced growth in our model are characterized by growing unemployment, ruling out a general shortage of ordinary labor. Nevertheless, for the less developed economies, the growth of some forms of enterprise may be checked by a shortage of skilled labor. Since this kind of economy is also likely to exhibit a deficiency of saving relative to the requirements of population growth, the case of labor supply as a limit might be appropriate in considering the adjustment to the excess demand type of unbalance. Due to limitations of space, however, we can treat adequately only the adjustment in the deficiency of demand case. Here, it will be assumed, the labor limit plays no important role.

The argument for capital funds as the limit to expansion of the firm depends heavily on the existence of uncertainty and the accompanying borrower's and lender's risk. Risk of bankruptcy and of wide fluctuations in earnings limits the ratio of borrowed capital to entrepreneurial capital from the borrower's side. Fear of loss of control limits the offers of new shares also to some proportion of entrepreneurial capital. From the lender's side, the insistence on reasonable security against the loan again limits the ability to borrow to some proportion of the firm's net worth. The availability of capital funds, then, is limited ultimately by the entrepreneur's own capital and this limits the size of the firm.

Some objections can be raised to this argument. First, uncertainty may be more specifically oriented than is often assumed. Instead of a vague, general timidity, uncertainty may reflect doubt about some particular aspect of the calculus involved in the investment decision.

If the doubt concerns some aspects of the expected performance of one method of production only, the risk premium should be deducted from the expected profits associated with that technique instead of being considered as affecting the supply of capital funds. Or, if the uncertainty applied equally to all techniques but is specifically uncertainty about the future volume of sales, this is properly thought of as a sales limitation on the firm's size. For capital expenditures which reduce the cost of producing a given output will not be impeded by uncertainty of this kind. There will undoubtedly remain, however, an important element of general uncertainty which cannot be related to any particular aspect of the investment decision; and this will be reflected in a reluctance to expand total investment beyond the limit imposed by entrepreneurial capital.

Still, there are good reasons for believing that the sales limit is more important in our economy, at least insofar as the capital-intensity decision is concerned. The large firms (which weigh most heavily in total investment) are fully aware of the obstacles to expanding their market shares and will often simply consider their growth as given by the growth of the market as a whole. Furthermore, they are usually in advantageous positions in the capital markets due to the lower degree of risk which normally accompanies large size, to their relatively great accumulations of entrepreneurial capital, and to the relative ease with which the dominant group can maintain control when the number of equity shares is increased.

Even with small firms, market situations where retaliation is expected are probably more prevalent than is generally assumed. Among many small firms selling similar products there will be local ("local" in the sense of product similarity as well as in the geographical sense) concentrations of more intense rivalry among a few. The sales limit seems, then, to be quite general in our economy, and we shall assume in the analysis that follows that this limit predominates.

So far we have considered only the capital intensity of the firm. But the average capital intensity of the economy can be affected by changes in the composition of firms even when there is no incentive to change the capital intensity of any single firm.

Insofar as different industries have different capital intensities,[5] market forces will affect their profits in varying degrees—but profits per unit of what? It is usually assumed that it is capital which moves to where its profit per unit is greatest, but this is correct only when

[5] We assume that all firms in the same industry are employing the some methods. This assumption is not essential, however. We could simply redefine an industry to include all those firms employing techniques of the same capital intensity, whatever they are producing. Then, general market forces will affect profits alike for all firms in the industry. The argument would proceed from there in exactly the same way.

capital funds represent the limit to the scope of the enterprise (because capital funds are limited by entrepreneurial capital). In the general case, it is the entrepreneur who moves from industry to industry and the incentive is maximum profits per entrepreneur. Wage, price, and interest changes will affect profits more in industries which have, respectively, high ratios of labor per entrepreneur, output per entrepreneur, and capital per entrepreneur. But there is no necessary relationship between these ratios and the ratio of capital to labor. Relatively high ratios of capital per entrepreneur and labor per entrepreneur within the same firm are perfectly compatible. Therefore, there is no presumption that these shifts will affect capital intensity in any definite way.

This would not be true if the capital funds limit were predominant in the economy. Since the capital funds limit is related directly to the size of entrepreneurial capital, maximizing profit per entrepreneur is equivalent to maximizing profit per unit of capital. Thus, whereas a rise in interest rates (or equipment prices) will not influence the optimum capital intensity for existing firms, it will shift enterprise away from those industries which have high ratios of capital to labor. Likewise, a rise in prices will pull enterprise toward those industries with high output-capital ratios; while a rise in wage rates will shift enterprise away from industries with high ratios of labor to capital. The necessary amendments to the table in Figure 2 can be accomplished by adding a minus wherever a minus or zero occurs in the third (capital funds) column and a plus where the plus occurs.

III

We are now ready to apply our theory of capital intensity to the case of chronic deficiency of demand. The first step is to establish what changes in prices, wage rates, and interest rates will occur when the growth of the labor force is insufficient to warrant capital widening equal to the flow of saving.

The unemployment due to the deficiency of demand will initially be accompanied by a redundancy of part of the capital stock. This will tend to reduce widening below the warranted rate and initiate a business cycle downswing. When the cyclical movement is reversed (for any of a number of familiar reasons), the pool of unemployed will permit capital widening to proceed in excess of the warranted rate in the upswing. Provided that the functions in Figure 1 remain unchanged, however, the fluctuations will tend to occur about an average trend as given by our crude growth model.

The only persistent element of disequilibrium in this situation is the growing (average) excess supply of labor. This means that wage

rates are likely to fall in relation to prices. The net effect of this on optimum capital intensity is likely to be disequilibrating (assuming sales to be the predominant limit to the firm's size; see Figure 2).[6] Only if interest rates fall sufficiently to overcome the perverse movement of real wage rates will the tendency for the capital coefficient to fall be absent. The "natural" movement of interest rates in this situation depends on what assumptions are made about monetary policy, which means that, in effect, there is no "natural" tendency in a state of chronic underemployment. In any case there are familiar reasons for supposing that beyond a point interest rates can be forced down only very slowly (at least with orthodox central bank techniques).

The tendency for adjustment in the capital coefficient in this situation to be disequilibrating results simply from the fact that a failure of the labor force to grow rapidly enough results (paradoxically) not in a labor shortage but in unemployment. Instead of rising real wage rates and the adoption of laborsaving techniques when the rate of growth of the labor force is too low in relation to the saving function, real wage rates fall and (in the absence of a sufficient reduction in interest rates) the capital coefficient adjusts in such a way as to widen the gap between saving and investment.

Though space limitations preclude an adequate treatment of the excess demand type of unbalance, it should be clear that here, too, real wage rates will tend to fall (as a result of chronic inflation accompanied by rising unemployment). In this case, however, the effect on the capital coefficient will be equilibrating (and will probably be reinforced by a rise in interest rates).

Before concluding, we should consider very briefly how the argument would be affected by relaxing the assumption of a constant state of knowledge. With growth of knowledge, labor productivity will rise (except as offset by diminishing returns due to fixed natural resources) and the optimum capital intensity may change in either direction or not at all, depending on whether the new, more profitable techniques use relatively more or less capital per worker than the previous optimum ratio. If we assume no population growth, the force behind expansion will be the labor freed as productivity rises. That is, over any period of time the labor force required to produce the average output of the period will diminish with the rise in labor productivity. If this freed labor is equipped with capital in the optimum ratio, causing capital widening just equal to the saving forthcoming from the income corresponding to full employment, there is balanced growth. This

[6] If wages and prices move in the same direction and in the same proportion, the effects on capital intensity exactly offset in this case.

freeing of labor can be represented by dL in Figure 1, and the problem of adjustment to unbalance is formally the same.

IV

Our conclusions can be summarized briefly:

1. Equilibrating adjustments in the optimum capital coefficient will normally be partially offset by disequilibrating movements in the labor productivity function; hence the market forces requisite to induce such an adjustment must be considerably stronger than would otherwise be the case.

2. However, given our assumptions (see 4 below), there is no natural tendency for the capital coefficient to adjust in an equilibrating way in the case of chronic deficiency of demand.

3. A situation favorable to automatic adjustment of the equilibrating kind in the deficiency of demand case would be inflexibility of money wage rates for downward (but not upward) movements combined with an easy money policy. An alternative would be a fiscal and monetary policy designed to promote capital widening in excess of the warranted rate; i.e., an overfull employment policy. For then growing labor scarcity would tend to induce shifts to laborsaving techniques (provided that interest rates were held down).

4. Our results depend on two important assumptions relevant to the theory of capital intensity: that firms are not vertically integrated and that sales represent the general limit to the size of the firm. If firms are vertically integrated, changes in real wage rates will not affect the optimum capital intensity for the firm in the sales limit case. (See Kaldor, *op. cit.*, pages 49-51.) If the supply of capital funds is the general limit, the results depend on the direction of movement of the over-all wage-price level as well as on relative wage-price changes and interest rates.

AN ECONOMETRIC MODEL OF GROWTH
U. S. A. 1869-1953

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I

In the last generation we have seen theories of economic growth cast in mathematical form. Since the publication of the work of Professor Kuznets and Dr. Goldsmith, we are supplied with long-term statistics as well. I am referring to their contributions in the 1952 volume entitled, *Income and Wealth in the United States, Trends and Structure.* Mathematical theories plus statistical data invite econometric research.

This model adds to the short list of long-term estimating models (other such: Tinbergen, Kalecki). It is the first to employ simultaneous estimating techniques. It has been extrapolated one period with satisfactory results; it can be used to test certain economic hypotheses and to derive the dynamic properties of the American economy.

Summary of the Model. Table 1 lists the variables and definitional identities. Table 2 shows the estimated structural relations. There are twelve structural relations and eight identities and twenty endogenous and seven exogenous variables. A brief picture of the economy follows: (1) Consumers' (including government) and producers' demand outputs. (2) Manpower-producing families and capital accumulators supply the factors of production. (3) Labor, entrepreneurs, landlords, and the financial sector claim income shares. (4) The factors of production are transmuted into the outputs demanded by means of a production function. (5) The actual factor-blend used in production depends on relative costs in the manner shown by a "substitution function." (6) The distribution of income is attained by bargaining and held within limits by occupational mobility. New manpower flows so as to prevent too great a disparity of average per capita income from one occupation to another. (7) To the real flow corresponds a counterflow of money, whose quantity is controlled by the government and the financial sector. Money influences the price level and this in turn affects distribution. The degree of activity (or wealth) and the quantity of money together determine the interest rate, which in turn affects capital accumulation.

The model derives its dynamics from lags (see Table 2, equations 4 and 8), but also from the use of time as a variable (equation 6). Other dynamizing devices are found in the cumulative nature of the

variables K and J (they are defined in Table 1, bottom) and also in the generous use of relative variables; for instance, those with K or J in the denominator.

Problems Specific to Long-term Econometric Models. Over and above the usual difficulties of econometric investigations, the building of long-term models presents special difficulties.

TABLE 1

LIST OF VARIABLES AND IDENTITIES

(All units are in annual averages for the decade, unless otherwise indicated. Stock variables are as of the midpoint of the decade.)

	Endogenous Variables	Units		Endogenous Variables	Units
b	Birth rate	Number per 1,000 of population	w	Money wage rate	1929¢ per hour
			Y	Gross real output	b—1929—\$
C	Consumption	b—1929—\$	e	Labor input	billions of man-hours per year
D	Depreciation	b—1929—\$			
E	% of N employed	full employment = 100			
				Exogenous Variables	
F	Financial income	b—1929—\$			
			d	Death rate	number per 1,000 of population
I	Gross investment	b—1929—\$			
i	Long-term interest rate	% per year			
			h	Standard hours	hours per week
J	Population	millions	L	Value of land	b—1929—\$
J^*	Population over 15	millions			
K	Stock of capital	b—1929—\$	M	Money	billions of \$
N	Labor force	millions	m	Net immigration	1,000s per year
			t	Time	1869–78 = 1, 1874–83 = 2 &c
N_π	Entrepreneurs	millions	U	% of N_W unionized	per cent
N_W	Wage earners	millions			
				Error Terms	
p	General price index	1929 = 100			
Π	Entrepreneur income	b—1929—\$			
R	Rental income	b—1929—\$	u or $u_1, \cdots u_{11}$	random shocks	
W	Real wage bill	b—1929—\$			

Identities

(I 1)	Output	$Y=C+I+D$
(I 2)	Income	$Y-D=W+\Pi+R+F$
(I 3)	Capital	$K=K_{-2}+10(I-D)_{-1}$
(I 4)	Population	$J=J_{-2}+.01(b-d)_{-1}\cdot J_{-2}+.001m_{-1}$
(I 5)	Labor force	$N=N_W+N_\pi$
(I 6)	Money wage rate	$w=Wp/52EhN_W$
(I 7)	Labor input	$e=52\times 10^{-6}EhN$
(I 8)	Population 15+	$J^*=J_{-3}(1-.01\cdot d_{-3})(1-.01\cdot d_{-2})(1-.01\cdot d_{-1})+.01\cdot m_{-2}(1-.01\cdot d_{-2})(1-.01\cdot d_{-1})+.01\cdot m_{-1}(1-.01\cdot d_{-1})$

The present state of our historical statistics compels us to build long-term models of rather frugal proportions. A model should involve a small number of variables, because several of the available statistical series rely on one another—this being particularly true of the earlier years. Too many interdependently constructed series produce fictitious

TABLE 2

STRUCTURAL RELATIONS
PARAMETER ESTIMATES*

Production	1	$Y=0.788e+0.29K+u_1$ (0.013) (0.006)
(L.SQ)	1′	$Y=.374e^{0.2488}K^{0.6991}u_1$
Substitution	2	$e=112.32+0.6396K-327(w/p)+u_2$ (21.84) (0.1508) (122)
Depreciation	3	$D=0.081+0.035K+u_3$ (0.18) (00.01)
Consumption	4	$C/J=-0.034+0.6997(Y-D)/J+0.311(C/J)_{-1}+u_4$ (0.011) (0.057) (0.069)
Investment	5	$100\frac{I}{K}=-1.6+0.71\left(100\frac{Y-W}{K}\right)-0.54i+u_5$ (0.96) (0.08) (0.30)
(L.SQ).	5′	$\frac{I}{K_{act}}=6.66+7.00\frac{K_{req}-K_{act}}{K_{act}}+u$
Birth rate	6	$b=33.67-1.175t+1.07\frac{(Y-D)/J_{-1}}{(Y-D)/J_{-2}}+u_6$ (3.65) (0.084) (2.51)
Labor force size (L.SQ)	12	$N/J^*=0.0794-0.000118(Y-D)/J+u$ (0.0078) (0.000015)
Labor force allocation	7	$\frac{H}{N_\pi}=-0.59+1.64\frac{W}{N_W}+u_7$ (0.21) (0.2)
Wage bargain	8	$w=w_{-1}-40.72+0.438E+0.240(p-p_{-1})+0.57U+u_8$ (36) (0.10) (0.05) (0.06)
Financial income	9	$F=0.014+0.0076iK+u_9$ (0.51) (0.0006)
Rental income	10	$R=0.48+0.0061iL+u_{10}$ (0.37) (0.0007)
Liquidity preference	11	$Yp/M=-0.0938+0.1520i+0.1958(100H/K)+u_{11}$ (0.27) (0.076) (0.046)
(L.SQ).	11′	$M/p=5.893+0.104(K+L)+0.0000768(K+L)^2-1.77i+u$

* The figure in parentheses is the standard error of estimate of the corresponding coefficient. Limited information maximum likelihood, unless otherwise specified. L.SQ. = least squares regression.

correlations. Few variables per equation should be used, because over a period of growth all variables increase (or decrease) several times their initial values and thereby exhibit a superficial intercorrelation that overwhelms finer structural relationships. Several well-intercorrelated variables in a single equation yield regression parameters of shaky statistical significance. Example: In the production function of Table 2, capital, output, and labor all increase substantially with time. Time and capital are so well correlated that it is impossible to introduce both in the production function and still obtain reasonable sampling error. Finally, a long-term model should contain a small number of equations, because if the few variables it contains are brought again and again in a great many equations they may eventually produce lack of identification.

TABLE 3

PERCENTAGE RESIDUALS FOR SELECTED LIMITED INFORMATION MAXIMUM LIKELIHOOD ESTIMATES

Decade	Equation Number										
	1	2	3	4	5	6	7	8	9	10	11
					(Sample Period)						
1	14.8	−45.4	29.0	−10.2	−5.0	6.2	18.1	32	−3.2	−88.2	16.0
2	22.4	−0.6	18.3	8.3	−3.2	0.3	−38.3	34	21.0	−27.3	10.3
3	18.1	16.5	10.0	1.6	−0.2	0.7	−41.7	−3	9.3	−13.8	11.6
4	12.6	18.4	10.0	−1.3	10.1	−6.0	−30.0	−8	−6.9	−17.7	1.4
5	34.2	6.5	0.1	−2.4	10.4	1.0	−5.2	−5	−13.2	−8.2	−4.5
6	0.9	8.3	−5.2	−0.2	−3.1	0.6	7.1	−8	1.1	8.7	−12.2
7	−2.2	5.0	−11.8	0.5	−10.5	−3.0	10.1	−23	9.1	24.2	−11.5
8	−0.5	4.2	−6.0	−0.7	−14.0	−4.7	16.7	−21	12.7	21.2	−7.7
9	−6.3	−6.5	−5.6	−2.4	−4.6	−1.9	23.2	−16	−3.1	13.5	2.4
10	−6.3	−6.3	−1.5	−1.1	10.6	3.3	11.1	12	−30.4	−10.3	5.1
11	−1.7	0.1	0.5	0.4	12.9	0.1	−6.1	7	−13.5	3.8	4.2
12	−0.2	−13.3	−4.4	1.6	−1.0	−7.1	−19.9	−5	4.5	−6.8	9.1
13	−12.8	−18.8	−4.7	3.5	−25.5	−11.2	−17.2	−5	14.3	−24.1	5.6
14	1.7	12.1	8.6	1.6	2.0	1.4	2.8	2	14.7	3.0	5.7
15	10.7	6.3	2.4	−2.5	10.4	17.2	14.1	1	−8.4	13.1	−0.4
					(Extrapolation)						
16	3.1	−8.1	−6.0	−0.5	63.5	8.0	4.2	9	−10.2	25.9	1.0

Lags and other similar devices (integrals, derivatives, accelerators, maxima, and minima) are almost indispensable for self-powering dynamic systems and are used very extensively in ordinary econometric models. But in long-term models it is often not legitimate to use these devices. We have more changing sets of people and firms, a dimmer memory of lagged variables, and a shorter inertia in behavior if we pass from decade to decade than from year to year. Naturally the optimum lag may itself be among the unknowns to be estimated. This would be possible if annual data were available though at the cost of lengthy computations.

We are cautioned, therefore, to use sparingly derivatives, lags, and other traditional devices that give dynamic patterns. But then how

can we describe the exponential, logistic, and other dynamic patterns typical of most long-term statistics?

First, it happens that certain relationships materialize if allowed enough time. For instance, the accelerator's constraint (spurious in the short run where you have excess capacity, overtime, and double shift as good alternatives to new investment) is the more likely to become felt the longer the period considered. I find it much easier to believe in a long-run accelerator than in its frantic short-run version. Second, to dynamize a model we may use "floors," "ceilings," targets, and other critical values obtained from technology or psychology. When a uniformly developing system (growing or decaying) hits a floor or ceiling, it is forced to alter its velocity of development, thereby causing a realignment of other variables by accelerator-type effects. Another dynamizing device is the building into the system of several potentially conflicting trends, like the simultaneous decrease in both the birth rate and in the death rate, or the simultaneous tendency for the labor force to increase and for weekly hours to decrease. Critical points when crossed alter the direction of growth in some part of the system—say in employment or distribution—and soon propagate disturbances throughout the system.

Like any econometric model, a growth model can also be dynamized by means of exogenous shocks. Exogenous variables are of two kinds: economic and noneconomic. The more noneconomic exogenous variables, the better. The fewer economic exogenous variables, the better. Shock-type changes occur in particular times and not in others for good reasons, some of which are to found in the process of development itself.

So much for the difficulties of long-term econometric model building in general. Now there are some special ones due to the nature of my data and the extent of my computing resources. The Kuznets and Goldsmith data, used in this study, come smoothed out in the form of decade averages overlapping five years. The first decade is 1869-78, the second is 1874-83, and so on. For consistency, the data derived from other sources were reduced to the same pattern of fifteen overlapping decades from 1869 to 1948. Averaged series are generally fictitious—meaning by this term that the variable in question seldom assumes a particular average value. Now it can happen that a particular value is a critical value; for instance, a "warranted" rate, or an equilibrium point, which, had it been hit, would have had special effects. The data used in long-term models are as a rule more drastically averaged than data used in short-term models, and therefore the long-term model is more likely to miss essential information from our deliberately ignoring the critical points. Suppose that we did possess annual, quarterly,

weekly, or daily data. We could proceed in two ways: average the data and then estimate the equations or estimate the equation and average the result. Unless all the series and functions are extremely well behaved, there is no guarantee that the two methods will give outcomes that agree. Further, in disregarding these possibilities we are postulating something akin to a "law of continuity" of behavior and brushing aside the whole question of whether cycles are organically connected with growth. So both the fact that averaged data are used and the fact that these averages are decade (and not some other) averages qualify the results and restrict the uses of my model.

Estimating Procedure. The parameters of this model were estimated by the limited-information–maximum-likelihood method. Those of you acquainted with the vicious algebra of the method may ask: why now use such an elaborate and refined method for crude data, rough approximate relations, and with so few degrees of freedom? The answer is that this method captures the spirit of simultaneity underlying the economic system that the model is supposed to describe: it treats all the variables on equal footing, avoiding cause-effect decisions between endogenous variables. In this sense the method is free of theoretical bias. The method is unbiased in the statistical sense as well (for large samples). However, I did not use the maximum-likelihood method in the full glory of its general form. Certain assumptions were made in order to simplify the computations.

1. The disturbances u were assumed to be non-autocorrelated in each equation. This overstates the efficiency of our estimates by pretending that the fifteen observations are independent. To see this, take a linear equation of the form $\beta y_t + \gamma z_t = u_t$ where β, γ are vectors of the unknown (constant) parameters, y and z vectors of the endogenous and of the predetermined variables and u_t the random disturbance at time t. It follows that $\sigma^2_{\Delta u} = E(u_t, u_{t-1})^2 = \beta E(y_t, y_{t-1})^2 + \gamma E(z_t, z_{t-1})$. Where the y's and z's are period averages overlapping half a period, they have a serial correlation of $\frac{1}{2}$. Therefore $\sigma^2_{\Delta u} = 0.5(\beta + \gamma)$, a fact which should be taken into account, except that β and γ are unknown, considerably burdening the computations. The first simplification then was to set $\sigma^2_{\Delta u}$ equal to zero.

2. *Linearity.* The numerous nonlinear variables such as, in Table 2, $e = 52 \times 10^{-5}\, EhN \frac{I}{K}, \frac{Yp}{M}$ contained in the model were treated equation by equation as if each were a simple variable, no correction being made in the estimating procedure to take account of these nonlinearities. Though it violates the strict requirements, this disregard of nonlinear variables leaves unaffected the statistical efficiency of my limited

information estimates. The alternative was to make the model strictly linear. Two reasons decided against it. First, the particular compound forms used are supposed to have economic and behavioral significance; e.g., e is the "labor inputs," $\frac{\Pi}{K}$ is the "rate of profit," and $\frac{Yp}{M}$ is "income velocity of money." Second, linear approximations generally necessitate a larger number of parameters to be estimated and I felt that I ought to economize the few degrees of freedom I dispose of. The model is linear in the parameters; and there are no side restrictions on the parameters.

3. An essential feature of the maximum-likelihood methods (with full or limited information) is to let each predetermined variable affect not only the parameter estimates of that equation in which it enters explicitly but of all other equations in the model as well. The common-sense equivalent of this property is that an exogenous shock or a lagged endogenous value permeates from end to end the simultaneous system of the total economy; computationally this is done by bringing into the estimation of each equation the matrix M_{zz} of moments of all the predetermined variables (z_i) in the entire system. But in fact the capacity of my computing equipment forced me to use only an arbitrary subset of the predetermined variables. This is the third simplifying assumption.

4. The fourth is the use of limited information. The method does not allow the parameter estimates of one equation to affect those of another. Adding, dropping, substituting, linearizing, or delinearizing a variable in one equation leaves unaffected the parameter estimates of another. Adding or removing an entire equation has no effect on the balance of the model. This means that if we wish to experiment cheaply with alternative formulations of given structural relations, we can do so under the limited-information method. In exploratory studies, the flexibility advantage of the limited-information method overweighs the disadvantage of suppressing some information. Since I think we know a little, a priori, concerning the form and number of independent long-term structural relationships, I am not so urgently interested in observing the modifications in one function brought about by some change in another or those brought about by dropping or adding an equation.

II

Evaluation of the Estimates. Though theory states that a certain relation exists, the particular econometric form of it that we adopt is reached by "cut-and-try" methods. A version is satisfactory if it combines a reasonable value of a parameter, small variance, and accuracy

in prediction. The first two qualities can be observed directly from Table 2.

In adopting this rather than that formulation, I have sometimes used a combination of arguments based on theoretical principles, on statistical necessity, and on expediency. This I frankly admit and, if you will, I may justify it in jargon by saying that with scarce and crude data, limited computing resources, and as yet undeveloped statistical techniques, what I did was to equalize at the margin the benefits from arithmetical minuteness, statistical subtlety, and theoretical rigor. You do have to sell your soul in the econometric business of today unless you have at your disposal tailor-made data and vast computing resources.

The results sometimes confirm and sometimes contradict accepted economic hypotheses. In view of all the inadequacies, the ability to confirm or contradict an economic hypothesis does constitute a step forward. In fact, I can do a little more; namely, predict in a limited sense.

Extrapolation of the Model. Estimating the model was begun in 1951, when only fifteen decades of data were available. At present, however, we have some data for a sixteenth decade (1944-53) and by means of them we can evaluate the predictive power of the model. The system of Table 2, if solved simultaneously, reduces to a ninth degree equation in Y. Inserting values for the predetermined variables, Y can be forecast, and working backwards all the other endogenous variables can be forecast too. To avoid this laborious task and yet be in a position to say something about the predictive ability of the model, I have proceeded in the opposite manner. I have obtained rough estimates for the years 1944-53 for all the variables, both endogenous and exogenous. These were inserted in the structural equations and they yielded certain residual errors for the decade 1944-53. These residual errors, in percentage form (Table 3), can be compared with the residual errors of the sample period. They should not be compared from column to column.

Actual investment (Column 5) is 64 per cent over the estimated but this is not surprising in view of the intervening world war and the investment boom it brought with it. Financial income was 10 per cent *larger,* and rental income 26 per cent *less* than "forecast"—probably due to wartime speculation and rent controls.

In the remaining equations, the model extrapolates to 1944-53 at least as well as it fits the sample period 1869-1948.

Implications of Our Parameter Estimates. In Table 2, I exhibit a linear homogeneous version 1 and a Cobb-Douglas version 1′ of the production function. The latter reverses the relative size of the contribution of labor and capital found by Douglas. We must remember,

however, that Douglas' study is for manufacturing only while mine is for the whole economy, and there is relatively less capital in the sum total of productive activities than in manufacturing industries. Secondly, Douglas' figures for labor input include wage earners only, while mine include the entire labor force; so my labor inputs, the variable e, are always greater than Douglas' N (in absolute terms) and my K is always less than Douglas' K (in relation to the labor inputs). Thirdly, there is no reason why the long-run marginal productivities of labor and capital should not differ from the short-run.

It is interesting to note that the sum of the exponents of $1'$ approximately equals unity, something akin to the Cobb-Douglas homogeneity hypothesis, only now for the long-run global production function. This implies that if income were distributed according to marginal productivity, the product would be exactly exhausted; if distribution does not in fact agree with the marginal principle, we ought not to blame the production function. Let us look at the marginal productivities in Table 4. Those of labor and capital have been computed from the production function and in Table 4 have been listed along with the real wage and the profit rate. In both cases the marginal hypothesis seems contradicted. Labor appears to be 1½ to 2 times "overpaid" while capital is persistently 3 to 5 times "underpaid." Before concluding too much from this we should remind ourselves that: the labor inputs in the production function relate to the entire labor force, while the wage rate relates merely to the wage earners; our statistics do not record the increasing skill, health, and education as additions to the labor inputs but as forms of capital (schools, hospitals, churches) and thereby understate the productivity of labor; many things can happen in aggregating over firms and industries to obtain a global production function. The fact that the latter turns out to be homogeneous of degree 1 is no proof that the individual production functions are too. It is possible that each industry or firm equates wages to the marginal product of labor, but that monopolies or fixed input-output requirements of one industry from another prevent the marginal product of labor from reaching a uniform level in the entire economy. Therefore the statistics carry no implication that in any one firm or industry labor gets more than its marginal product. For the underpayment of capital, there are a number of fancy explanations: British predilection for investment in America; cheap money agitation; managers maximize size of business; they make consistently overoptimistic estimates, and others which do not diminish my astonishment at the unexpected results of Table 4.

Professor Arnold C. Harberger offers the following pragmatic solution: We know that the various income shares show remarkable stabil-

ity over a long period of time; that, at least in the long run, there is competition both in the product and in the factor markets; that there has been technological progress. Therefore we should utilize this knowledge to fix the exponents of our Cobb-Douglas production function at some reasonable level and from this estimate the remaining unknown; namely, the contribution of technology.

If we use as exponents the average value of the factor shares, as in Table 4, $av\ (W/Y) = .540$, $av\ (\Pi/Y) = .177$, $av\ (R/Y) = .074$ we

TABLE 4

MARGINAL PRODUCTIVITIES, REMUNERATION OF LABOR AND CAPITAL, AND INCOME SHARES

	Labor (In 1929 cents per hour)		Capital (In percentage)		Income Shares (Percentage of GNP)		
	Marginal Product	Real Wage	Marginal Product	Profit Rate	Wages	Profits	Rent
1. From equation 1′							
Decade 1	7	17	41%	11%	53%	19%	8.3%
2	8	24	41	9	55	16	9.5
3	9	27	35	8	56	17	8.8
4	10	27	31	8	56	18	8.1
5	10	27	26	7	53	20	8.3
6	11	29	25	8	51	22	8.5
7	12	30	24	7	50	21	9.1
8	12	32	24	7	50	21	8.8
9	13	33	22	6	50	20	8.8
10	15	40	22	6	52	18	7 9
11	17	48	22	5	54	16	7.5
12	18	51	20	4	55	14	6.2
13	18	52	19	4	56	13	4.4
14	20	60	24	5	60	15	3.9
15	21	63	25	5	59	16	3.4
Average					54	17.7	7.4
2. From equation 1 Average for 1869–1948	8		29				

Equation 1″: $Y = .72K^{.177}(52 \times 10^{-5} Eh N_W)^{.54} L^{.074}(1.08)^t$

obtain by least squares the formula 1″ (Table 4, bottom), where .72 and 1.08 are the estimated constant factor and the technological growth factor, respectively.

Eight per cent per decade is equivalent to about ¾ of 1 per cent (cumulative) per year. This rate is not unreasonable for that part of growth not due to increase in labor force or to increase in capital.

Elasticities. Table 5 shows point estimates of the various elasticities connected with the production function: They are defined as ratios

between the logarithmic derivatives of Y, e, and K. The three columns present the output elasticity of labor inputs (capital held constant), the output elasticity of capital inputs (labor held constant), the elasticity of substitution of labor for capital (output constant). The ratio of two values of ηeK for two decades is identically equal to the ratio of the values K/e for the same two decades. Similarly, the trends of ηYe, ηYK are average productivity trends Y/e, Y/K.

We notice that the elasticity ηeK decreases quite rapidly with time and this indicates that the economy produces a given output in more

TABLE 5

ELASTICITIES OF TRANSFORMATION AND OF SUBSTITUTION

	Decade	η_{Ye}	η_{YK}	η_{eK}
1. From the production function 1....				
	1	.35	.50	−1.44
	2	.27	.50	−1.86
	3	.24	.58	−2.40
	4	.23	.66	−2.81
	5	.22	.78	−3.54
	6	.20	.80	−4.04
	7	.18	.84	−4.59
	8	.17	.84	−5.01
	9	.16	.90	−5.88
	10	.13	.93	−7.07
	11	.11	.90	−7.99
	12	.11	.99	−9.22
	13	.11	1.01	−9.76
	14	.09	.87	−8.95
	15	.09	.81	−9.21
2. From the production function 1′....				
Average for 1869–1948		.2488	.6991	−2.81

and more capital-intensive ways. In the decade 1939-48, for instance, a 1 per cent increase in capital would have (for the same output) displaced 9 per cent labor, while in the decade 1869-78 it would have displaced only 1½ per cent labor. These comparisons are significant only to the extent that the linear production function 1 (Table 2) fits the data well. As a matter of fact the exponential form 1′ fits them better and its elasticities are constant over time.

The "substitution function" (equation 2 in Table 2) has two aspects. First, it is a technological relation. Though particular firms or particular industries may operate under fixed coefficients of production, by substituting process for process or industry for industry, we can in the aggregate technology speak of substituting labor for capital. As for any firm or industry, so, too, for the aggregate technology, there are limits to substitution. Second, the function describes an economic

relation. It determines which factor-mix out of the many possible will be actually employed, and (equation 2) tells us that more capital will be used the higher the real wage rate. For instance, if the level of capital is 360 billions of 1929 dollars and wages are 63 real cents per hour, then a 10 per cent increase in real wages will lead to a 4 per cent contraction in labor inputs; at the same level of real wages and capital a 10 per cent increase in the capital stock would require a 4 per cent increase in labor inputs.

Turn to the first version of the investment function (equation 5). It implies that a one-point rise in interest brings the rate of investment down by roughly one-half of a percentage point. As our equation is linear, we cannot use it to test the interesting speculations whether investment exceeds all bounds at near zero interest rates. The alternative version (5′) is an accelerator type. From the substitution function, we can compute the amount of capital that is best for any given level of output, real wages, and labor. Investment is determined by the attempt to adjust capital to the appropriate level K_{req}. Equation 5′ says that the rate of investment is more than seven times the rate of capital shortage.

The dynamics of the birth rate (equation 6) are straightforward, with the variable t (time) summarizing all the sociological and ecological trends that pull down the birth rate. Shorter run fluctuations in the birth rate are related to prosperity and depression. Other things being equal, one more baby per year is added to each 1,000 of population for every 9 per cent annual increase in per capita real income. To maintain the birth rate at any realized level requires an average increase in per capita real income of 11 per cent annually.

Equation 12 confirms the hypothesis that people choose to take part of their progress in leisure for more individuals, in addition to more leisure for a given number of individuals which is reflected in the decline in working hours.

Equation 7 shows how the total labor force divides itself into its two main occupational categories: the wage earners and the self-employed. It is not necessary for every worker to have occupational choice but that there be a marginal group having mobility. If mobility were perfect and income the only consideration, the constant term of the equation would be zero and the second parameter of equation 7 equal to one.

We have discovered that the global production function cannot explain the factor shares by means of the marginal productivity theory. The wage bargain equation 8 formulates the common-sense view that wages depend on prices, on the power of the unions, and on the degree of prosperity.

The Monetary Equation. In equation 11, I have expressed Kalecki's theory of long-term liquidity preference, while equation 11′ is an asset preference ratio theory of money balances. M is monetary assets of the nongovernment, nonbanks public. The curvature is as expected. The richer the community the greater the proportion of its assets it can afford to hold in liquid form.

III

Dynamic Properties of the Model. To show the derivation of the model's dynamic properties is a laborious task. I shall limit myself to telling what the results are.

The Long-run Multiplier and the Domar Problem. In solving for equilibrium conditions, we find the long-term marginal propensity to consume very close to unity. At most, 23 billion 1929 dollars of autonomous, unproductive, net investment are required annually to maintain employment equilibrium. If, however, the required investment is all productive, since it raises output in the future, it must increase at the rate of 3 per cent per year, assuming constant population and constant labor force. If, as is predicted by population experts and sociologists, the labor force percentage should continue to increase for two or three decades more and then become stabilized while population continues to rise at the present rate, the rate of growth in the required investment is considerably smaller than 3 per cent in the long run, and perhaps the savings gap will close by itself.

The Inflationary Bias. The income distribution and the monetary equations solved simultaneously as a subsystem reveal that if other things remain equal an autonomous rise in the price level leads to a sharper rise in the equilibrium money wage.

The financial income equation (9), disregarding the constant, says that roughly three-quarters of the value of capital yield financial income. This is in agreement with the fact that approximately 20 per cent of total capital is social capital (roads, monetary silver, and gold) which does not yield financial income.

Similarly, not all land yields "rental income." Public land must be subtracted: it is about one-fourth of the total in acreage, though it is hard to say what percentage it is in value terms. About 40 per cent of homes and farms are owner-occupied. The rest are rented but their yield is not counted in rental income unless the proprietor engages primarily in real estate. As a rough guess about one-third to one-fifth of the leased land belongs to this category. All in all, rental income yielding land should be in the neighborhood of two-thirds of the total. This, too, agrees with equation 10.

Conclusion. This simplified account of my study shows that for broad

purposes, one set of a dozen or fewer equations captures the outline of the American economy over a long period of time. In spite of laborious compilation of data and refined manipulations of time series, I have admittedly contrived only a rough sketch of the American economy. But there is some satisfaction in the very roughness of the task. By tapping only the more accessible surface riches of our new statistical series and by testing econometrically only for the bolder generalizations of "magnificent dynamics," one is rewarded with easy victories. As you see, it is possible to get some stable estimates with reasonable implications and with predictive ability. If I am to evaluate the general significance of my work myself, the most modest conclusion I can draw is this: Pessimists, cheer up! It *can* be done!

DISCUSSION

EVSEY D. DOMAR: Mr. Power's paper is in two parts: the first is concerned with the relationship between the growth of the labor force and general economic growth and stability; the second is devoted to the study of the effects on capital intensity (that is, the ratio between capital and labor) of changes in the interest rate and in the prices of labor and of capital equipment. An analysis of these effects is required for the solution of the problem raised in the first part.

The first part presents a growth model consisting of four simple equations:

$$(1)\quad I = c\,\frac{dL}{dt}\,;$$

$$(2)\quad S = sY\,;$$

$$(3)\quad Y = pL\,;$$

$$(4)\quad I = S\,,$$

where c stands for capital intensity, s for the fraction of income saved, p for average labor productivity, and I, L, S, and Y indicate investment, labor force, saving, and income, respectively.

The solution of this system takes the form of

$$(5)\quad \frac{\frac{dL}{dt}}{L} = s \cdot \frac{p}{c}\,.$$

In other words, under the assumed conditions, there exists an optimum rate of growth of the labor force which will just assure sufficient investment for the maintenance of full employment; and a deviation, up or down, from this rate will result in a cumulative process of inflation or deflation respectively.

The structure and solution of Mr. Power's model are so similar to those of the investment models of Harrod, Fellner, and others (and it can be easily shown that the capital coefficient used in the latter is but c/p), but one may wonder what special purposes it serves. I believe there are several.

It allows the builders of other growth models to see their creation, so to speak, from another side, which may give rise to some second thoughts. It is obvious that constancy of the capital coefficient implies constancy of the ratio between capital intensity and labor productivity (c/p); yet this had not occurred to me.

Mr. Power's model shows how an attempt to equip a rapidly growing labor force with sufficient capital equipment can simultaneously create inflation and unemployment—a phenomenon not unfamiliar to students of undeveloped countries. But the fact that the remedy lies in a higher propensity to save may be of interest to some of our more devout Keynesians.

Finally, the model makes explicit the conditions which give rise to a most interesting paradox in the theory of growth; namely, that an insufficient

growth of the labor force can cause the unemployment of labor—a paradox mentioned by a number of writers but usually without the naked simplicity of Mr. Power's model. (See the discussion of this subject by D. Hamberg, H. Pilvin, R. F. Harrod, and E. D. Domar in the *Quarterly Journal of Economics*, August, 1952, pages 444-449; November, 1953, pages 545-563; and November, 1954, pages 641-648.) They have been concerned that an attempt to invest all the savings which the public desires to make would cause an over-accumulation of capital, presumably relative to available labor, and that the capital thus made idle would lead to a fall in investment and hence in national income and employment. This presupposes that the ratio between capital and labor (capital intensity) is fairly rigid, and I cannot help wondering if all those who have used this paradox as an explanation, or at least one of the explanations, of the downswing are also willing to subscribe to the assumption on which it is founded.

To raise a question of this type may well be the main purpose of simple mathematical models: they hardly describe reality, nor can they predict, but they may induce the general economist and the man of affairs to give a second thought to a position previously taken.

The second part of the paper deals with capital intensity; that is, with the ratio of capital to labor. This is indeed a most interesting subject the importance of which transcends its use in this particular model. It is not a new subject in economic literature but unfortunately it has been mostly used (or may I say misused) in business cycle theories. (See the discussion and bibliography in Friedrich and Vera Lutz, *The Theory of Investment of the Firm* [Princeton, 1951], pages 137-142.) Let me put cyclical considerations aside and restate the problem in the following manner: why does it pay to use American machinery produced with expensive American labor to save other expensive American labor, while it frequently does not pay to use, say, Japanese machinery produced with cheap Japanese labor to save other cheap Japanese labor? If Japanese machinery were used to replace American labor, the answer would be obvious; but the shoe is on the other foot, and quite often it pays to use American machinery produced with expensive American labor to replace cheap Japanese labor. My question undoubtedly sounds naïve, and the answer may be perfectly obvious; but I must confess that it escapes me, at least in the more or less static setting of Mr. Power's model, which does not include an analysis of technological progress as such.

Abstracting from the latter, we can reduce the question to two simpler ones: will a fall in the interest rate and a rise in wage rates increase capital intensity; that is, bring about the substitution of capital equipment for labor? If wages rise relatively to prices of capital equipment, the answer is obvious (I hope). This is the assumption that Mr. Power uses, but I have doubts whether it is fully justified on empirical grounds if sufficient time is allowed, as it should be in a secular problem, for the completion of all adjustments. From an analytical point of view, the other possibility—that prices of labor and of capital equipment rise at the same (relative) rate—is of course much more interesting.

For the solution of this problem, we are referred to Kaldor's article on "Capital Intensity and the Trade Cycle." (*Economica*, "New Series," 1939, pages 40-66.) It is a most interesting paper (though I do wish that its author, having shown his well-known analytical virtuosity in the body of the paper, would then have added an appendix for the general reader). Two cases are considered: (1) when the size of the firm is limited by capital funds, and (2) when it is limited by the extent of the market for its products. In the first case, Kaldor reaches the surprising—at least at first glance—conclusion that capital intensity will not be affected by changes in the interest rate, because, by assumption, every project considered by the firm requires the same amount of capital. The latter is really rationed, and hence its price is of no importance, unless it rises high enough to make this assumption ineffective. On the other hand, the amount of capital being given, a more capital-intensive project uses less labor and has a smaller output and hence a larger profit margin per unit of output than a less capital-intensive one of equal profitability. Therefore an equal proportionate rise in prices and in wages will discriminate in favor of a more capital-intensive project.

Kaldor's second case assumes an unlimited supply of capital funds but a limited demand for the product. The conclusions of the first case are now reversed: the interest rate is effective because the capital-intensive project uses more capital; but an equal (relative) change in the prices of both labor and capital equipment is of no importance because two equally profitable projects have identical cost curves. Kaldor's whole discussion is based on the assumption of constant returns to scale.

Kaldor's two special cases (and they are quite special) only whet one's appetite rather than satisfy it, but an excursion to *The Theory of Investment of the Firm*, by Friedrich and Vera Lutz, where a number of possibilities are analyzed in great detail, does not resolve the problem either, particularly as far as the change in prices of labor and of capital equipment is concerned (the authors are somewhat more positive regarding the effect of the change in the interest rate); and we are told that depending on the exact nature of the profit-maximization process and on the shapes of demand and cost curves and other conditions, the effect on capital intensity can be in either direction. And this is odd, because the greater capital intensity in the American economy as compared with others appears to be so clearly established that a reasonably unequivocal explanation of this phenomenon should be forthcoming.

The problem surely deserves further study, and I hope Mr. Power will continue working on it. May I make a few very simple suggestions:

1. It is about time to start distinguishing between a firm and an industrial process or a project. The amount of capital funds available to a firm may be given, but not necessarily to each project. On the other hand, the market for a particular product may be limited, but a firm can create new products. (On this see Edith T. Penrose, "Limits to the Growth and Size of Firms," in this volume.)

2. Similarly, it is about time to stop the identification of funds available to a firm with its investment in capital equipment. Funds are obtained not only for such investment but also to buy raw materials, pay wages and taxes,

and make all sorts of expenditures. After all, capital equipment is not always bought; it can be rented.

Finally, I suspect that we shall make little progress in this field without a closer analysis of technological change and without an explicit recognition of uncertainty.

T. C. SCHELLING: My comments relate, first, to the structure and, second, to the perspective in time of Mr. Valavanis' model.

In making the acquaintance of a twelve-equation model it is sometimes helpful to look for familiar, simpler models embedded in it, being on guard against the dangers in taking a submodel out of context.

We can ask, for example, what in the model makes income grow. A complete answer depends on the whole system of equations and even to describe how it grows requires a ninth-degree equation. Still, the main engine must be simpler. There are only two demand equations for final goods—consumption and investment—and they must be central to the growth process.

In the consumption equation, population explains a rising level of absolute consumption but not the rise per capita. The high long-run propensity to consume, however, of about 100 per cent, needs only a little investment to become explosive; and the lag, by holding the "current" propensity to about 70 per cent, strongly damps the explosion. (If investment followed a simple relationship to income, for example, the growth formula would be approximately $Y = [30/(30\text{-}v)]Y(t\text{-}1)$, with v denoting the propensity to invest and the lag being a complicated average of about five years.)

The Valavanis investment equation can partly be construed as a "propensity" related to profits; if we multiply through by $K/100$, one term is "income minus wages." But then it also has a term equal to the capital stock times a constant plus the interest rate. While the interest rate component could be interpreted here as a refinement of profits to a net "after-interest" basis, the negative effect of the capital stock on investment strongly suggests the acceleration principle rather than a propensity to invest out of profits.

The acceleration principle emerges quite clearly if we treat the interest rate as a constant, and consider $(Y\text{-}W)$ as a constant percentage of Y. The whole investment equation than translates into

$$I = a[kY\text{-}K]$$

where k can be interpreted as the "normal" capital/output ratio, and the parameter, a, reflects the rate over time at which investment tends to bring capital stock into normal relation to output. This is pure acceleration principle.

The interest rate is not in fact constant; but its variation over the period exerts little leverage in the Valavanis model. The constancy of $(Y\text{-}W)$ in relation to Y can be improved by inclusion of a time trend that would not be hard to rationalize in the acceleration relationship.

Whether investment is really acceleration-motivated is not proven by the fact that this translation can be made; and I doubt whether the "correct" structure of an investment equation will ever be discerned in such highly aggregative time series data. What the translation shows is that investment,

income, and capital grow, in the Valavanis model, as if a familiar multiplier and accelerator yielded nicely damped explosive growth over the eighty-year period.

Probably any pattern of actual growth is bound to look like a multiplier-accelerator model over the long run, and we must not deduce too much motivational significance from the appearance. But it does help acquaint us with the mechanics of the present model to see its close quantitative analogy with the familiar machine. Incidentally, the strong consumption lag in the Valavanis model yields an unusually stable mechanism of accelerator growth.

We did not ask above whether the parameters of this accelerator model yielded growth rather than cycles. They do, but since they were fitted to a period of actual growth, their values were nearly bound to. But we are naturally tempted to inquire how close they are to yielding cycles, and to manipulate the model in various ways to see whether shocks can lead to cycles, or how price inflation works through the system, etc. Unfortunately, most such interesting questions have to be ruled out of order, for reasons that lead to the second part of my comments—on the statistical timing of the model.

The data from which the model is derived are decade averages, spaced five years apart. There can be no business cycles in such data, except very long ones or such greatly damped and distorted ones as emerge from the averaging process. Similarly, the model cannot generate any cycles but very long ones. Even ignoring the averaging process, the shortest time interval is five years. And the only inflationary process that can be traced through the model is, consequently, one that emerges from long-run wage trends.

But what good is a model that cannot generate business cycles? This question is asked not because we are interested exclusively in cyles but because business fluctuations in the period covered by the model have been of such importance that we must question any analytical scheme that is inherently incapable even of recognizing those that occurred.

The above question is not purely rhetorical. Whether the model is valid depends a good deal on whether long-run economic development in this country has in fact been essentially long run in its behavior dynamics or has been instead the continuous compounding of essentially short-term behavior. If we knew—on the basis of knowledge other than long-run time series—that investment decisions were mainly related to current or short-term factors, then a long-run model might reflect some kind of average behavior; but it would probably be fairly unreliable for analysis or prediction, it could differ greatly from the "true" structure of the system, and it would probably yield no information about the motivation of investment at the level of the individual firm.

I would emphasize that this question about the Valavanis model is not the usual one of long- versus short-run determinants of growth. The model is not just long run; it is long-run and highly endogenous in its mechanics of growth. It does not incorporate trends, with the main exception of population. It is a self-propelled machine that ignores the intradecade bends in the road and navigates from a minimum of secular benchmarks. So our full question should read: can we abstract both from the endogenous short-term dynamics

of the American economy and from the long-term exogenous trends, and find a substantial body of long-term endogenous relationships that are not only valid but so influential that they govern, decade by decade, the long-run pattern of growth?

Mr. Valavanis' hypothesis is that we can; and, within the limitations of aggregative time series correlation, his results are some test of that hypothesis. Unfortunately, until some annual data are reconstructed for the same period, a competing hypothesis relying on shorter term behavior dynamics cannot be fitted for comparison.

CURRENT PROBLEMS IN AGRICULTURAL ECONOMICS

THE SUPPLY OF U.S. FARM PRODUCTS UNDER CONDITIONS OF FULL EMPLOYMENT*

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Appropriate quantitative estimates of the agricultural supply function under full employment do not exist. However, some writers have suggested that either the elasticity is zero or that the variables underlying the supply functions are entirely exogenous to the economic system.[1] While agricultural production does not vary greatly between years, the elasticity coefficient is certainly greater than zero.

Full interpretation of the agricultural supply function in an environment of full employment can be made only with several years of complex empirical research including: (1) specification of the appropriate analytical model (i.e., the relevant variables and their possible algebraic forms); (2) measurement of the relevant observations; and (3) prediction of the coefficients which make up the system of equations involved. These empirical predictions are difficult over a period which encompasses the full range of variations in employment; perhaps they are impossible for the smaller number of time-series observations which represent the relevant span of full employment. The period of years which provides the framework for observing the agricultural supply function under full employment is both short in years and heavily confounded by other phenomena. The only two periods of full employment which are meaningful for our purposes are 1910-29 and 1942-54. Even then, half of the first period represents one in which the agricultural plant was still being expanded by the addition of cropland and total farm acreage. Also, a war emergency existed in both of these periods; nonprice restrictions and incentives cause these years, as well as some of those immediately following wars' end, to be somewhat inappropriate for predicting the nature of the agricultural supply function. In reference to the future, the 1942-54 period alone may

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[1] Wilcox and Cochrane (*Economics of American Agriculture* [Prentice-Hall, 1951], pp. 413-418) suggest that the supply function is a vertical line. Brewster and Parsons ("Can Prices Allocate Resources in Agriculture," *Jour. Farm Econ.*, Vol. 28) state that farmers do not respond to price because they are motivated by "mechanistic" rather than "economic" forces

be meaningful for predictions. The 1910-29 period represented a completely different complex of techniques, capital structure, and firm-household bonds. Because of the dearth of appropriate time-series observations and because of the complexity of the phenomena, we make no attempt to provide quantitative statements. At best, our discussion represents hypotheses about the nature of "selected variables" which enter into and affect the elasticity of the supply function. Time prohibits even a "description" of all the relevant variables.

Supply Functions for Individual Products

If the elasticity coefficient is great relevant to consumer demand, it results in wide swings in the output of particular commodities: there is a relative scarcity in some periods and a relative surplus in others. If it is too low, a relative surplus of particular products will persist over time. (We define a surplus or deficit as marginal value products which are lower or higher respectively than those which might be earned by the same resources in alternative employment opportunities, considering existing barriers to transfer of resources.) The short-run supply functions for individual farm products have relatively high elasticity under conditions of full employment. Elasticities are great enough to cause large diversions of resources between agricultural products over the span of a single year. Over the full employment periods 1920-29 and 1946-54, acreages of crops such as potatoes, flax, soybeans, sugar beets, barley, cotton, onions, pimentos, and other vegetables quite often differed between years by as much as 25-50 per cent. These are, of course, crops where the slope of the production possibility curve (or important segments of it) for individual farms and regions normally does not differ greatly from the slope of the isorevenue curve (i.e., the substitution ratio between crops differs relatively little from the "normal" price ratio). Even for major crops such as corn and wheat where substitution ratios and price ratios between products do differ considerably and a large portion of the farm plant is devoted to their production, annual changes in acreage sometimes have approached 10 per cent in full employment periods. Cattle fed and slaughter lambs fed and cattle and sheep on farms have recently changed between years by as much as 10-20 per cent. These changes in inputs of particular classes of resources (acres and animal numbers) fairly well denote changes in production planned by farmers; other classes of inputs change similarly, to the extent that they are close technical complements of land and animal units.

The interproduct transfer of resources within agriculture takes place as readily as the interproduct transfer of resources within major industrial sectors. In one sense, this transfer within agriculture takes

place with greater ease in agriculture than in industry. Most of the interproduct transfer of agricultural resources between years takes place on individual farms at one geographical location. Very little of it results from the transfer of labor and capital resources between such distinct products and locations as cotton in Alabama and oranges in California. The supply function for individual farm products is highly elastic because of these reasons:

1. The production function, particularly for annual crops, approaches an elasticity of 1.0 on individual farms. We are speaking, of course, about the crop production function characterized by a transfer of more of all resources to a particular commodity. Over a considerable acreage range on all farms, increasing land acreage in fixed proportions with its technical complements results (aside from weather fluctuations) in about a proportional increase in output of an individual crop. For example, a corn belt farmer growing twenty acres of soybeans may double his output if he pushes soybean acreage up to forty acres and at the same time doubles the input of labor and capital services; if the acreage for soybeans is diverted from corn, decreases in the output of the latter generally will be proportional to the amount of resources withdrawn. Of course, as we aggregate farms, a given percentage increase in inputs for a particular crop will result in successively smaller additions to output as the added acreage must spread to soil types less adapted to the crop. While this phenomenon cannot be looked upon as causing the elasticity of the individual farm production function to depart from unity, it does increase the slope of the supply function and causes its elasticity to decline for all farms considered together.

2. Large changes can be made in the quantity of resources used for particular products without causing important changes in the total quantity of resources employed within agriculture and causing large shifts in the geographical location of capital and labor resources.

3. The skills of labor and the services of capital resources have great adaptability between some products. For example, labor and machinery adapted to corn production are generally adapted to soybean production.

4. The production possibility curve is one with great flexibility for transfer of resources between products. On many farms, it is composed of linear (or near-linear) segments specified by the production limits of each individual resource. In Figure 1, for example, the possibility curve becomes *abcd*. If the slope of the *bc* segment falls within the range of price ratios experienced, the individual farm may readily shift product combinations back and forth between *b* and *c*. Of course, since these "between corner" segments are of different length (take on varying slopes for different farms and may even be slightly concave on

some), the aggregate supply curve for one individual product is not linear, although it has a high elasticity coefficient. (Because of uncertainty considerations, the combination of products may fall within a segment such as *bc*.)

5. Shift of resources between products often does not entail any great change in uncertainty. Resources may be on hand to produce either radishes or carrots, corn or soybeans, barley or potatoes, etc. Transfer of resources between two such products does not entail the same degree of risk as transfer of labor to a manufacturing enterprise or in adding large amounts of capital to the farm enterprise (and, consequently, in reducing the firm's equity).

The Aggregate Supply Function

The short-run supply function (i.e., one extending over a single year or two) for all farm products aggregated together presents a different picture. Either because the price flexibility of major resources parallels that for agricultural products in general or the phenomena which underly it cause the supply function to decline or to have low elasticity, output does not respond as readily to changes in factor/product price ratios. To be certain, aggregate output of farm products does respond, under conditions of full employment, to price changes. However, the aggregate output is much less sensitive to price change than is the output of individual commodities. Using 1910-29 and 1942-54 as our full employment periods, we find that gross farm production has never increased by more than 8 per cent between years; it has never decreased by more than 10 per cent. Changes this large in output result mainly from weather variations rather than from planned changes in resource inputs.[2] Changes in inputs, although slightly affected by exogenous variables such as weather, better suggest changes which farmers plan. Total inputs of agriculture increased by 4 per cent from 1919 to 1920. While most of this maximum increase was due to price, some of it also was due to above average yields. The largest decrease in inputs over a single year was 3 per cent from 1915 to 1916; some of this decline also was due to weather. Perhaps the greatest change planned between years by farmers, as measured by inputs, has never been over 2.5 per cent. A longer period of contraction was 1920-24 when both absolute and relative prices of farm products declined; total inputs decreased by a total of 5 per cent. Major expansion periods, accompanying a rise in absolute and relative price levels, were 1917-20 and 1942-49; aggregate inputs increased by totals of 8 and 9 per cent, respectively. Changes over a few years do not, of course, represent

[2] T. W. Schultz (*The Economic Organization of Agriculture* [McGraw-Hill, 1953], Chaps. 7 and 13) gives a detailed account of these quantitative changes.

a long enough time period to truly indicate the kinds of plans which are made in response to price changes. Most changes in the farm plant which affect longer run supply function rest on expectations over a period of years. Periods of full employment as long as twenty years, with factor/product ratios for agriculture drifting continuously in one direction, are probably needed before we can predict the elasticity coefficients for particular periods.

Adjustments in inputs—those facets of the supply function over which farmers do have control—have been more sensitive than examination of aggregate inputs would indicate, however. Technical innovation and relative prices have placed different premiums on resources. They have called for increases in some resource inputs and decreases in others. These changes partially cancel each other in the aggregate index of inputs. For example, total labor inputs decreased by about 10 per cent in the period 1942-49 while fertilizer increased by 74 per cent and annual inputs of building and machine services increased by 60 per cent. In the twenties period of contraction in agriculture, fertilizer and lime inputs decreased by 30 per cent in a single year from 1919 to 1920; power and machinery inputs declined by 18 per cent from 1920 to 1925, even though the "technical revolution" in agriculture was beginning to press (even in the face of declining price relatives) for use of more of these resources. We also must recognize that some sectors of agriculture have an increasing role while others have a declining role in a developing economy. Economic development occurs largely in periods of full employment. With a growth in national product and per family income, the income elasticities of demand call for a withdrawal of resources for some agricultural products and an expansion for others. These several changes within agriculture tend to cancel each other out and "obscure" the magnitude of the elasticity coefficient. While representing only small segments of agriculture, numerous farming areas can be used to show remarkable changes in product output and resource input. Negative or very low income elasticities of demand and contraction in foreign sales and other changes have provided price forces resulting in withdrawl of 40-50 per cent of the nonland resources in some areas. In other selected farming regions, growth in the national income, relatively high income elasticities of demand, and other forces giving rise to increases in relative price for particular products have resulted in large expansions in both outputs and inputs. While other forces were also at work, one need only turn to the first century and a half of American agriculture to view an extremely elastic supply function. At a lower stage of economic development and with a set of income elasticities of demand calling for increased output, agriculture

expanded in a manner which has seldom been surpassed by other industries.

Because of these many "offsetting" trends affecting resource inputs and because of the "joint variables" involved, refined prediction of supply elasticities might be obtained only through simultaneous estimation of the several structural relationships which "make up the system." Empirical predictions, with the proper degree of refinement, would undoubtedly prove the supply elasticity to be greater than a superficial examination of aggregate input and output suggests it to be. A simple plotting of aggregate farm output (or, for that matter, aggregate inputs) against agricultural price relatives, or a simple least squares prediction of the regression coefficient, probably tells us little about the elasticity of the agricultural supply function. This procedure can only provide a "mongrel relationship" which is neither the fish nor fowl of the supply function. First, there is not a supply function over a period even as short as five years, but rather a whole series of supply functions. There is a different supply function for each change in techniques, for each change in exogenous variables such as weather, for each change in the absolute or relative price of a particular resource and for each change in certainty of farmers' price expectation (both in respect to farm prices and nonfarm prices, such as industrial wage rates). Second, supply and demand functions jointly affect prices and quantity produced; where both are subject to change, an estimation of one function apart from the other may be quite meaningless. (A supply function can be estimated by least squares regression techniques only if the supply function remains constant and the demand function goes through a series of changes and price and quantities are the only variables.) Finally, the supply function for agriculture products cannot be predicted accurately apart from the demand and supply function for various categories of agricultural resources.

Aggregate supply responses may not be rapid when compared to those of individual agricultural products or to particular industrial products. However, certainly a sustained twenty-year period of full employment, with relative agricultural prices continuously moving either down or up, would give some very sizable adjustments. We are not, of course, saying that the elasticity coefficient is as great as 1.0. We are only saying that (1) in the short run it is considerably greater than zero and (2) over a period of years a succession of long-run supply curves, which consider changes in commitments of labor skills and preferences as well as in physical plant, would become operative to show agriculture as a price-responsive industry. Accordingly, we wish to summarize, first, conditions which cause short-run supply functions to

be relatively inelastic but which become greatly relaxed over longer periods and, second, phenomena which surround supply functions and cause them to appear, particularly when measured as a simple plotting of output against price relatives, to have greater slope than is actually true.

Forces Encouraging Low Elasticities in the Short Run

Supply elasticities tend to be low in the short run because of the following reasons.

1. The reservation price of agricultural labor is low for a portion of the farm population. (This phenomenon is simply one facet of flexible resource prices outlined later.) We suspect that income from agriculture relative to income from use of the same resources in other opportunities may drop by a considerable amount before many farm owners, upwards from middle age, will transfer their resources out. Not so many of their sons, however, will go into farming if incomes are relatively low. Other segments of labor also have low mobility in the short run, because of uncertainty and lack of knowledge, but would not remain in agriculture for decades under low resource returns.

2. Capital limitations place a damper on the rate at which assets are added in the short run. With a high degree of risk aversion built into their psychological make-up during depression, farmers in general may be willing to add assets only at about the rate which they can build up equities at the outset of full employment periods. Over a longer period of time, however, as the farmer's equity becomes high (as it is now), he may make large added investments if relative price ratios remain favorable and certain over a long period.

3. Because of uncertainty and capital limitations, farmers typically use so few resources that transformation ratios are considerably greater than factor/product price ratios. An increase in the price ratio brought about by a decrease in product price need not cause the amount of resources used to decline proportionately; the price ratio can increase considerably before it approaches the transformation ratio (although uncertainty may cause some contraction). As factor/product ratios decrease through a relative increase in product prices, farmers are still reluctant to drive transformation ratios lower (through the use of more resources) until they approach price ratios. However, over longer periods of favorable prices, their risk discounts may decline, allowing transformation and price ratios to be more nearly equated.

4. The production function is "more fixed" and less elastic in the short run than in the long run. The aggregate production function is limited, on the side of expansion, to a nearly-fixed plant in acreage; for single products, land can be increased in about the same proportion as all other categories of inputs. (Similarly, "space" limitations allow

particular industries to expand their plant in a "scale fashion"; production functions can have elasticities approaching 1.0.) The elasticity of production (and hence that of supply) is lower as the number of fixed resources is increased. With a fixed plant, the elasticity of the aggregate production should be less than 1.0, although it also may be composed of linear segments approaching 1.0. We doubt, however, that the aggregate production function has a "corner" separating ranges of high and low elasticity as sometimes proposed.[3] In the first century and a half of this nation, agriculture was faced with a long-run production function wherein land inputs could be increased freely and in proportion to the increased capital and labor inputs (i.e., in the sense of a "scale expansion"). We need only look back into history for indications that agricultural supply is not a variable exogenous to the economic system. No industry has responded more readily to the national economic development factors (particularly a "high" income elasticity of demand for food in a rapidly growing consumer economy). Land has, however, become largely a fixed factor (on the side of expanding the agricultural plant) in the aggregate production function. Technical innovation now acts over the long run to provide the elasticity of production formerly allowed by land. Technical innovation as it relates to the agricultural production function can be viewed in this manner: The production function is of the form $Y = f\ (X_1, X_2, X_3, X_4, \mid X_5 \ldots . X_n)$. Here, the vertical line separates resources which are variable or fixed in quantity. As the bar is moved to the left, the elasticity of the variable inputs declines; as it is moved to the right, their elasticity increases. The input of a particular resource, such as hybrid seed corn or stibestrol, is fixed at zero before the innovation. Upon innovation, the bar moves to the right of this resource (i.e., the input of the particular resource is no longer "fixed at zero" in the production function).

[3] Wilcox, "Effect of Farm Price Changes on Efficiency in Farming," *Jour. Farm Econ.*, Vol. 33, proposes this possibility on the basis of a particular fertilizer experiment. A "corner" on the production function (i.e., one segment of a marginal cost function forming a near-angle with a more vertical segment of the marginal cost curve) would allow price ratios to teeter over wide ranges across this fulcrum without specifying a different quantity of resources. However, research on fertilizer and feed with fixed production units as small as a single acre or a single animal does not show distinct corners on the production function (and hence on the marginal cost function). These "fixed plant" production functions generally show the elasticities to decline by degree rather than abruptly. Hence, the aggregate production, defined by the addition of fertilizer, feed, and their technical complements to a fixed acreage defining the agricultural plant also should have an elasticity which declines only by degrees. In fact, many farmers use resources in ranges of the production function which still have very high elasticity. While resources in the Great Plains, for example, may need to be combined nearly as "fixed technical complements" (C. Gislason, "Nature of the Aggregate Supply Function of Agricultural Products, *Jour. Farm Econ.*, Vol. 34) and may have low elasticities beyond this "sequence of tasks," the aggregate supply function need not be "sloped" accordingly. Even if every farmer has a "distinct point of production," gradations in soil productivity and adaptability would still cause the supply function, aggregated over all soils and acreage, to slope "more gently and continuously."

Hence, innovation and the increase in input of this resource (allowing it to become a variable in the production function) causes the elasticity of production for the remaining resources to increase. The longer the time period and the greater the number of innovations, the more elastic the production function becomes. (Space does not permit us to go into the details as to which resources under innovation become technical complements and "factor using" or substitutes and "factor saving.")

5. Miscellaneous forces such as the close bonds between the firm and the household, low reservation prices on particular resources and a greater degree of short-run fixed costs, also interact to give a supply elasticity which is relatively low at one point in time but which certainly increases under a long span of full employment. The forces mentioned above cause supply to be relatively inelastic in the short run but allow the elasticity to increase in the long run; they "hold output in check" over the short run of increasing price relatives, although they need not do so over longer periods. The forces mentioned below tend to encourage a given level of output even in the face of declining price relatives; but they need not support an extremely low short-run elasticity coefficient.

Variables Causing Supply Elasticity to Appear Low

As suggested by Elmer Working three decades back, any phenomena which causes demand and supply functions to change simultaneously may result in "simple empirical" observations such as those shown in Figure 2.[4] Here quantities are determined by the supply and demand pairs *a* and *z*, *b* and *y*, and *c* and *x*. If one plots the quantities against price, he obtains a "mongrel" line such as *M*. Using it to denote the supply functions, he would certainly conclude that it has an extremely low elasticity. However, the "true" supply function (*x*, *y*, or *z*) in any period has a much greater elasticity. We offer the following to explain why supply elasticity, under full employment, may be greater than sometimes predicted:

1. Flexibility in factor prices.[5] Factor prices may parallel product prices in flexibility. Supply and demand functions then move together in the fashion of Figure 2. While the supply function may be relatively elastic, the sequence of annual outputs give a "mongrel production curve" *(M)* with great slope. D. G. Johnson has illustrated the importance of flexible factor prices in explaining maintenance of agricultural output during depression ("The Nature of the Supply Function for Agricultural Products," *American Economic Review*, September, 1950). While applying to fewer resources, fixed factor supplies and flex-

[4] Elmer Working, "What Do Statistical Supply Functions Show?"

[5] This is the case of Marshall's stones receiving quasi-rents and can be discussed almost synonymously as inelastic factor supplies or high fixed costs.

ible factor prices also apply during relative price changes in full employment periods. Prices are relatively flexible, over short time spans, for all resource services which have their origin in agriculture. While short lags exist, prices of breeding or feeder stock and feeds generally move in the same direction as prices of livestock products. Feed and breeding or feeder stock normally make up 80 to 90 per cent of the resources used in meat production. Accordingly, with a fall in the demand schedule from *b* to *a* in Figure 2, the supply function also falls, as from *y* to *z*, because of lower prices of feed and livestock resources. In crop production, the price of land services, as denoted by share rents, also parallels crop prices in flexibility even over the short span of a

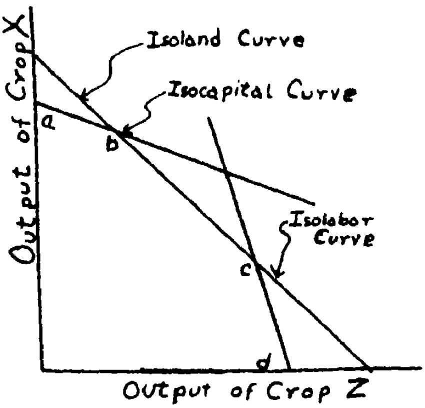


FIGURE 1

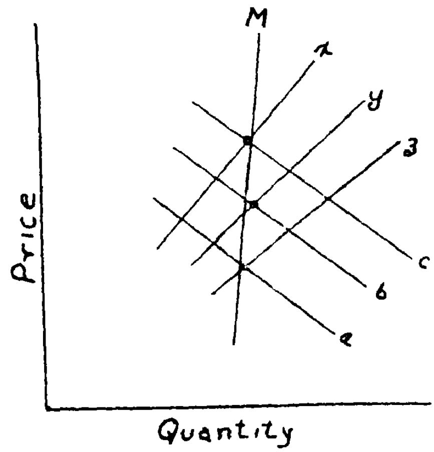


FIGURE 2

year. The reservation price of most land is near zero. Because of its limited supply in the agricultural production function, the price of its services parallels the price of its products. We have already indicated that in the short run a segment of the labor force in agriculture has low mobility and a low reservation price. Within limits, many established and older farm operators will take a lower labor return and stay on the farm rather than move to industrial employment where returns are higher. A similar situation holds true for a portion of the capital embodied in farm buildings and machinery. Over a short period of five to ten years, the major supply of building and machine services comes from stocks of these resources located on farms rather than from new stocks moved in from the machinery and lumber industries. Under declining prices, these "quasi-rent resources" are willing, because of their specialized nature, to take low returns. On the side of farm expansion (i.e., increasing price relatives), however, new machinery and building prices tend to be less flexible.[6]

[6] Numerous resources such as fertilizer and miscellaneous supplies have relatively inflexible

2. Technical change. Most technical changes, especially biological innovations, have the effect of lowering per unit costs of production; otherwise they would not be adopted. (Some techniques will be favored more in one price situation than in another; e.g., a machine technique will be favored in periods of high labor/machine service price ratios.) Hence, with declining price relative to agricultural products, output can be maintained even if the supply function is elastic. Starting from demand function *c* and supply function *x* in Figure 2 and with two successive declines in demand, the supply function may decrease to *z* because of technical innovation. Again, examination of changes in output will lead one to view "mongrel curve" *M*, and suppose the supply function has an elasticity of nearly zero. Actually, the elasticity may be much greater, as is suggested by curves *x, y,* and *z*.

3. Capital accumulation and redistribution of assets. Full employment periods tend to bring about some redistribution of agricultural resources, particularly land. Job opportunities and wage rates which are higher than "reservation returns in agriculture" pull the more mobile portion of the labor force out of agriculture. Some farms are released for rental or purchase by others. At the same time, favorable farm profits give some remaining operators funds to add to their holdings. Changes in farm size apparently have been, aside from retention of part-time and nominal units, quite large in many agricultural areas. In overcoming historic, institutional, and other barriers, units which are more efficient in use of machinery have emerged most rapidly in full employment periods.[7] Because of the machine cost economies associated particularly with crops, cost functions have tended downward. With declining costs, the pattern of Figure 2 may again be traced out to suggest "mongrel curve" *M*.

This paper has provided hypotheses about major variables affecting the elasticity of the supply function. Time has prevented discussion of other variables. Unfortunately, the paper has the limitations of many other journal articles. It is mainly a "set of literary hypotheses." Urgently needed is an empirical study which predicts the many coefficients in the set of structural relationships and which are necessary for meaningful statements about supply elasticity.

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prices, as compared to farm products. Whether or not the price is flexible makes little difference for a resource which is a technical complement to another resource which does have a flexible price and makes up a small portion of total inputs. For example, inflexibility in the price of livestock minerals, small tools, and similar items has little bearing on the use of such resources.

[7] Although there are, in the terms of Gislason ("The Nature of the Aggregate Supply Function of Agricultural Products, *Jour. Farm Econ.*, Vol. 34), still "a sequence of tasks directly related to cultural practices to be done," these can be accomplished as well by the consolidating farm as by the previous small owner.

A MODEST PROPOSAL FOR SURPLUS DISPOSAL

By MARTIN BRONFENBRENNER
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The philosopher, T. V. Smith, when discussing matters outside his professional ken, takes care to speak "as an ignorant man and a philosopher." I do not yield to T. V. Smith in ignorance, but I am not a philosopher. The general economist, however, stands to the expert in specialisms like agricultural economics in somewhat the same position as does the philosopher to the social scientist. So perhaps I may be pardoned for appearing before you "as an ignorant man and a general economist."

Any ideas of mine on agricultural surplus disposal must be modest because of my ignorance. These particular ideas will be for another reason as well: they are largely unoriginal. They are based not on things unknown but on things forgot—and only partially forgot at that. They are largely a refurbishing of the McNary-Haugenism of the twenties, with a dash of econometrics borrowed from the forward pricers and a dash of Keynes borrowed from the Keynesians. The sum total, I have been told, is not very different from the practices now in use in surplus disposal for perishable commodities like butter.

A relapse into McNary-Haugenism is defensible. This philosophy was too radical and revolutionary for the Era of Wonderful Nonsense in which it originated, the nonsense then including federal budgets balanced at about 3 billion dollars. It has become conservative and old-hat in the present Era of Wonderful Nonsense, which includes support of everyone's prices and wages and letting inflation take the hindmost. Now Nonsense Can Be Wonderful and Life Can Be Beautiful, without excluding occasional deviations into sense, or into death.

Preconceptions of an Ignorant Man. An easy first step in solving the surplus disposal problem would be stopping all future surplus accumulation. This could be done, as we all know, by free markets, by forward pricing (in periods of high employment), by stringent acreage and output controls, or by crop destruction, etc. But the political strength of organized agriculture, the log-rolling skill of its spokesmen, the positive appeal of the parity idea, the negative appeals of subsidies, output limitation, and "killing little pigs" combine to preclude elimination of surpluses through lower prices or reduced output. Therefore I take for granted that we shall have with us a problem of disposing of increments to surpluses, as well as of existing or holdover surpluses,

substantially more than half the time for most of the major storable farm crops at going prices.

By a surplus I mean explicitly an amount larger than required as a disaster reserve for the United States or as the American share in a disaster reserve for the world at large. I mean, also, an amount larger than can be distributed feasibly in school lunches or poor relief anywhere in the world without distorting the normal markets for the goods we are considering. I recognize, also, sufficient limitations on farm bloc power to rule out as not only dictatorial but impracticable all suggestions to eliminate food surpluses by setting up compulsory "adequate" diets as liens on the disposable incomes of nonfarmers. In short, I am trying to render the surplus disposal problem nearly as difficult in my model as it is in real life rather than defining important aspects of the problem out of existence at the start.

The subject of our panel relates particularly to the international aspects of surplus disposal. Here again it would be easy to assume as the goal of our international economic relations a set of free-competition and free-trade policies which would simplify the issues tremendously. Free competition and free trade would restrict our surplus accumulations and decumulations within the dimensions of disaster insurance funds. They would outlaw as monopolistic any accumulations and disposals, at least by individual countries, intended primarily to influence either world or domestic prices. They would equate the domestic prices of all our agricultural imports and exports with world prices, adjusted for transport costs. I cannot disagree with Professor Johnson's position, for example,[1] that such are the logical consequences of free trade as applied to agriculture. But once again, I propose to assume instead that the farm bloc, having not only tasted blood but gorged upon it for the better part of a generation, will be able to veto many of these corollaries of free trade. Instead of free trade, then, I am asking you to assume with me that our international economic policy be limited to the less exciting goal of multilateralism—meaning effective competition by all exporting countries in the markets of all importing countries but normally not effective competition between foreigners and domestic interests. In this connection, the term country should be defined broadly enough to include customs unions like Benelux, temporary customs-union arrangements like the US-Philippine Trade Pact, and preferential areas like the British Commonwealth and French Union. But on one other point I must ask your indulgence for evading a problem which may be more significant than I

[1] D. Gale Johnson, *Trade and Agriculture, A Study of Inconsistent Policies* (Wiley, 1950), Chaps. 1, 2, 11; "Agricultural Price Policy and International Trade" (Princeton: *Essays in International Finance*, 1954), pp. 8-11.

believe it is. I wish to speak mainly in terms of a single abstract "agricultural product" and ignore special problems of individual crops and of complementary or competitive relations between them. I am thinking of this abstract agricultural product as a storable item, with low transport costs relative to its normal value. It is normally an American export item, which may, however, be imported if the American price is above the world price. It is a raw material for other products, agricultural or industrial, in which Americans compete with foreigners in both domestic and foreign markets. Wheat, corn, and cotton are three important feet which this shoe seems to fit quite well. I hope we do not lose too much by neglecting other feet of the agricultural centipede, which the shoe fits rather badly.

The Proposal. The leading features of the plan I wish to lay before you can be outlined under a few main heads.

Instead of supporting domestic prices by no-recourse loans, let a public corporation like the present Commodity Credit Corporation or the Hoover Farm Board purchase agricultural surpluses for cash at support prices. (I suppose that there will be such support prices, whether based on "parity" or not, and whether rigid or flexible in character. Among these various methods of supporting farm prices, I refrain deliberately from any choice. The surplus disposal problem is difficult enough "for an ignorant man and a general economist" without throwing in the entire "farm problem.") Title will rest clearly in this public corporation—let us call it Federal Agricultural Surplus Corporation or FASC, if we can stomach the fascist implications of the initials. FASC will then have full authority and full responsibility for disposal of surpluses.

At the end of every crop year, let the FASC set up a monthly schedule for the next twelve months of the sales to be made on the world market at world prices, whatever these may be. Let this international sales schedule be public knowledge. Let the FASC actually make these sales, either directly or through private exporters. (If sales are made to private exporters, they should be made by competitive biddings; i.e., at whatever prices exporters can afford at current and prospective world market prices. The roundabout procedure of selling to exporters at domestic prices and subsidizing their losses when they sell at world prices should be replaced by surveillance to prevent diversion of export purchases back to the domestic market. If the United States adheres to an international agreement governing the commodity, deliveries of American export quotas to the international commodity authority should not be included in the international sales schedule.) In years of disaster or the abatement of disaster at home and abroad, the FASC must of course be permitted to revise its international sales schedule

downward or upward for the remainder of the crop year, but only after the maximum practicable amount of public notice.

The aggregate sales during any normal crop year should exceed the increment to surplus in the preceding crop year, and therefore reduce the accumulated surplus on hand. The FASC should not, however, wreck the world market (as the Farm Board did in 1931-32) by dumping its entire accumulation at one fell swoop. It need never lower its normal holdings below a reasonable disaster reserve or "ever normal granary," as estimated by competent commodity specialists with a minimum of political interference. This reserve, of course, should not be held idle when disaster actually strikes, like gold reserves under some versions of the gold standard. They should be drawn upon to meet the drought, flood, war, or other emergency and replenished later.

Some arbitrary figures may illustrate how this scheme might work, how far the FASC can be guided by fixed rules, and how much discretion it must apparently be awarded by the nature of the problem. Let the accumulated surplus prior to the initial year of this plan (year 1) be 10 million units (bushels), including 2 million bushels from the crop of the year immediately prior (year 0). Let the safe disaster reserve be estimated (discretionarily) at 5 million bushels. Then the amount to be sold on world markets during year 1 might be from 2 to 7 million bushels, distributed by months according to the ordinary seasonal pattern of world demand. Suppose the figure chosen is 3 million bushels. This would leave the surplus at the beginning of the next year (year 2) at 7 million bushels plus the increment of surplus from crop year 1. If this increment of surplus exceeded 2 million bushels, annual sales by FASC in year 2 would presumably exceed the 3 million bushels of year 1; if the increment fell short of 2 million bushels, annual sales would presumably be less than 3 million bushels. But these are discretionary decisions, subject only to the general rule that sales in each normal crop year should exceed the increment to surplus from the last crop year whenever the total surplus exceeds the disaster reserve. (This simple illustration presumes a static situation, in which the disaster reserve remains constant over time. In actual practice, there will be increases and decreases in the reserve, depending on such factors as increasing population, changing foreign production, development of substitutes, improvement of transportation, revised probability assumptions, etc.) When the surplus falls, in year t, to 5 million bushels plus the increment of year t-1, the program of year t would be limited to disposal of the last year's surplus.

If, through any reason (disaster or miscalculation), the surplus at the beginning of year t should fall short of 5 million bushels plus the in-

crement from the previous year's crop, part or all of that increment would be retained unsold.

Should a disaster (crop failure, flood, drought, war, etc.) occur or be in prospect, the disaster reserves would of course be mobilized and not held idle. At the same time, at FASC discretion, the international sales schedule for the remainder of the crop year might be reduced or canceled. FASC should also be given discretion to increase or reinstate an international sales schedule when a shortage ends during a crop year or when a threatened crisis fails to materialize.

The heart of this proposal lies in the public announcement each August or September (say) of the FASC's monthly international sales schedule for the next year. If the disaster reserve has been dangerously depleted in prior years, there may be a purchase instead of a sales schedule. This procedure allows for dribbling, but not in most years for dumping,[2] the American surplus upon the world market at prices below American domestic ones. It withdraws the looming threat that the United States may wreck the world market entirely by disposing of its entire accumulation. Normally it exerts a constant downward pressure on world prices. This should not be belittled if world demand is inelastic, but on the other hand, when we consider the inelasticity of American domestic demand, this downward pressure may be little greater than it would have been in a completely free American market with the domestic price lowered to the world level. The added depressive element may also be offset in part by the added element of certainty implied by the scheduling of sales by the FASC. This certainty is itself not complete, covering only a year at best and subject at worst to drastic and sometimes destabilizing revisions[3] of the international sales schedule, in response to the rumors, presences, and abatements of droughts, floods, locusts, and wars.

Financing. Buying at high domestic prices and selling at lower world prices, the FASC is doomed to financial losses in normal years, which

[2] Our distinction between dribbling and dumping loses much of its validity in years of unusually large surplus accumulation. In the case of wheat, for example, the Commodity Credit Corporation's holdings amounted on June 1, 1954, to 878.6 million bushels as against 514.4 million on the preceding July 1. Disposal in the single year of 364.2 million bushels, or 70.8 per cent of the previous total, is hardly a dribble

[3] As an example of destabilization, assume a failure of the Indian wheat crop, met in part by depletion of the American disaster reserve. The depletion is accompanied by a reduction of the American international sales schedule for the remainder of the crop year. The world wheat price, raised by the short crop in India, may be raised further by the reduction of the American international sales schedule. (The lowering of the American disaster reserve will be an offset, but usually not a complete one.) A similar argument applies on the downward side of the market when a crisis situation is concluded or avoided. Here the combination of American disaster-reserve and international-sales-schedule changes may lower world prices by more than they would have fallen with no revision of American policies.

will probably exceed its expected gains from operations with the disaster reserve. Under the present system, losses can be concealed for long periods by carrying surplus stocks, or nonrecourse loans based on them, upon the books of public corporations as assets valued at purchase prices. (During the political campaign of 1954, the total cost of the existing farm price support program since 1933 was often stated at less than 1.5 billion dollars, at a time when the Commodity Credit Corporation was holding over 6.1 billion of such questionable "assets.") The losses would be revealed almost immediately by any plan requiring, as this one does, drawing down of surpluses above a disaster reserve. (The disclosure feature is, in my judgment, a point in this plan's favor; many will doubtless judge otherwise.) At any rate, the problem of how the FASC deficit will be financed arises sooner and more continuously under this plan than under the existing system.

Prior to the Keynesian revolution of 1936, it was taken for granted that such deficits would be financed completely by farmers, or if not by farmers, by the processors of agricultural products.[4] This would avoid drain on the general funds of the federal government and conform to the period's concept of sound finance; namely, a balanced or slightly overbalanced budget of minimum size. A number of proposals satisfying this condition were made during the period 1921-32.[5] Of the few proposals which I have read, the most impressive appears to be the McNary-Haugen "equalization fee." Under this plan, federal marketing losses on each commodity would be financed by a specific levy[6] on each acre of land sown to that commodity by a farmer participating in the plan. The levy, which we may call an equalization fee, would be assessed whether the crop was marketed or used on the grower's farm, except that no farmer should be required to pay more in equalization fees than the difference between domestic and world prices on the quantity which he actually sells.

Participation in the plan and payment of equalization fees should both be voluntary. Nonparticipants, however, should not be permitted to sell on the domestic market at the supported prices. They should be restricted to foreign sales or to the use of their output on their own

[4] A typical statement of the underlying ethics is from George N. Peek and Hugh S. Johnson, *Equality for Agriculture* (Moline, Ill.: Moline Plow Co., 1922), p. 15, reproduced by Murray R. Benedict, *Farm Policies of the United States, 1790-1950* (Twentieth Century Fund, 1953), p. 210: ". . . agriculture ought not to produce a surplus which cannot be sold above cost of production, and if it does so produce it must stand the loss. Every farmer who produces contributes to that loss and ought to stand his share of it."

[5] Benedict, *op. cit*, Chaps. 10-11. In addition to the equalization fee plan discussed immediately below, the "export debenture" and "domestic allotment" plans achieved wider support during this period than did any other proposals dealing at all seriously with financing problems.

[6] In conformity with some recent Farmers Union proposals, progression might be introduced into the levy as a measure to encourage family over corporate farming.

farms. Such a restriction as this was a feature of the domestic allotment plans of Professor Black and others during the late twenties.[7]

The equalization fee mechanism has a definite political advantage over financing from the general fund. It reduces somewhat the farmer's stake in high domestic prices, which he must now pay himself in part. It therefore reduces the conflict between the farmer on the one hand and the consumer or taxpayer on the other. This mechanism has also a corollary economic advantage over financing from the general fund in that it reduces the farmer's incentive to allocate his resources to the "wrong" crops,[8] whose prices are being supported above the level justified by the world demand for them. (This text has been criticized for failure to consider the export debenture plan, which would accomplish the same purposes as the equalization fee by a reverse mechanism. Under the export debenture system, the farmer receives the export or world price plus certificates whose value varies with the domestic price and the losses of the price supporting agency. The export debenture plan achieves greater simplicity than the equalization fee but is more difficult to adjust to modern fiscal insights, as indicated below. It also forces farmers to become speculators against their will and inconsistently with their abilities if they must sell certificates for cash before the value of the certificates is determined.)

There are also sound economic arguments in favor of general-fund financing of any FASC deficit. Modern fiscal policy teaches that a budget deficit may be a desirable means of increasing total expenditure when the national income is not keeping pace with productive capacity. General-fund financing of an FASC deficit would increase the flow of income at such times and should not be renounced in advance by exclusive reliance upon equalization fees or other schemes of self-financing. And even in normally prosperous times, a general-fund contribution to the normal FASC deficit may be useful to induce participation by small farmers who market relatively little of their produce.

The advantages of the equalization fee can be combined with the insights of modern fiscal policy, at the cost of some complications of administrative procedure. Each year's FASC deficit may be financed in the following year, partially from the general fund and partially by the

[7] John D. Black, *Agricultural Reform in the United States* (McGraw-Hill, 1929), Chap. 10. Also W. J. Spillman, *Balancing the Farm Output* (New York: Orange Judd, 1927), *passim*. Cited by Benedict, *op. cit.*, p. 267.

[8] Doubt has arisen regarding the quantitative importance of misallocation of resources between crops under the existing programs, once these resources have been committed to some form of agricultural activity. It is difficult to find farm products which are being "underproduced" because of the overproduction of those whose prices are being supported. Cf. J. K. Galbraith, "Economic Preconceptions and the Farm Policy," *Amer. Econ. Rev.*, March, 1954, pp. 46-48. Professor Heady's paper represents a rebuttal to these skeptical doubts, valid (in my opinion) for sufficiently long periods, less valid for the short term.

proceeds of commodity equalization fees. The proportion between the two parts, however, should vary with the business cycle in a sliding scale. The government should foot most or all of the bill when conditions are generally depressed; the farmer should foot most or all of the bill when inflation threatens the general economy. Farm income from price supported commodities may be expected to correlate with the national income more closely than farm income in general. It will be most unusual to find equalization fees major burdens on, say, wheat farmers in inflationary periods, even though income from wheat might

FINANCING THE FASC DEFICIT

If GNP in Year t Exceeds GNP in Year $t-1$ by	The FASC Deficit of Year $t-1$ Should Be Financed in Year t by	
	Equalization Fee	General Fund
Less than 0%	0%	100%
0–2	20	80
2–4	40	60
4–6	60	40
6–8	80	20
More than 8	100	0

have moved quite inconsistently with the national income in the absence of support for wheat prices. The variable equalization fee and the variable government contribution would then operate as a small "built-in stabilizer" for the control of economic oscillations.

A possible basis for division of the deficit is indicated in the table. It depends upon the year-to-year rate of growth of the gross national product in current prices. Percentages above and below the long-term upward trend of national income or product would be more desirable, given a substantial measure of agreement upon the trend line itself. Variability is provided, but changes are to be made according to rules with little or no administrative discretion.

These figures are included purely as illustrations. Experts in agricultural finance may devise other schedules using the same principles and arriving at more equitable results.

In some years FASC operations will show surpluses. These will be years of scarcity in which disaster reserves are being liquidated at high prices. The surpluses should be held in special funds against subsequent deficits, in the manner of the Social Security Trust Funds. Accounts for each crop should be separated insofar as possible, so that the equalization fees paid on each crop will contribute to FASC deficits in the purchase and sale of that crop. Suppose that, in year t-1, FASC operations show a profit in cotton and a loss in wheat. Wheat farmers should then pay equalization fees, in year t, even though the over-all

FASC operations of year t-1 show a surplus, and cotton farmers should pay none even though the over-all operations of the FASC show a deficit.

Tariffs and Quotas. Free trade in agricultural products and in products largely manufactured from them is impractical so long as government policy holds the domestic and the world prices of agricultural products apart. It would be pointless, for example, to permit free imports of corn and pork while holding the domestic price of corn above the world price. The result of free trade in corn would be that the FASC would buy the entire American corn crop, while foreign corn would take over the entire American market for reasons completely unrelated to comparative advantage, relative factor endowments, or other determinants of the normal flow of free international trade. If foreign corn were excluded from the American market, free trade in pork products would drive the American hog raiser out of business because of higher feed costs, again without justification in the theory of international trade. Professor Galbraith (*op. cit.*, page 49) puts the same conclusion in reverse: after domestic prices have been raised, departure from free trade "restricts imports that have first been made artificially attractive."

This much is elementary. It is equally elementary that no fixed tariff rates, either specific or ad valorem, can serve as offsets for the differential between domestic and international prices when the differential itself is a variable. My suggestion, therefore, is that fixed tariff rates both specific and ad valorem, on both agricultural products themselves and their principal products, be replaced by schedules of flexible rates. The flexible rates should vary automatically as often as is practicable—every month, quarter, or year—with the differentials between the domestic and the world prices of agricultural products. The differentials should be computed as absolute amounts in connection with specific duties, and as percentages in connection with ad valorem duties.

This sliding-scale system is preferable to the alternative system of supplementing tariffs with import quotas and with tariff quotas. This alternative system, while more arbitrary, is simpler and is more favored in present American practice. A sliding-scale duty system has the advantage, however, of leaving the American market attainable to foreigners who lower their production costs by increased efficiency not connected with the differential between American and world prices, while the quota system makes no subtle distinctions among the causes of increased foreign imports. Furthermore, the sliding-scale duty system has the advantage of reducing discrimination between individual importers and exporters. The windfall rewards for getting particular consignments in under quotas will be reduced, and also the windfall

losses for getting them in late. A certain amount of discrimination, however, will remain as necessary consequence of periodical rate changes

International Agreements. We have been speaking of a two-price system, in which there are only world and domestic prices. This is an oversimplification—sometimes a dangerous one. If there is an international commodity agreement covering our agricultural product, exporting and importing countries will meet annual quotas and an international agency will accumulate disaster reserves. Export and import quotas will be met at an agreement price which, being fixed for a reasonably long period, will normally differ somewhat from the actual deal. The "agreement price" is itself usually double. There is a buying price for export quotas and a selling price for import quotas. The selling price is normally somewhat higher than the buying price. The administrative and storage expenses under the international agreement are wholly or partially paid out of the differential between the two prices.

In normal years, we are safe in supposing an agreement price lying somewhere between the high American domestic price and the low unregulated world price. In scarcity years, the agreement price will be the lowest of the three. In considering whether the United States should participate in such an agreement, attention should probably be concentrated upon the normal or surplus years. If circumstances are as we have supposed them, the agreement will then offer an outlet for part of the American surplus on terms more favorable than the world market. On the other hand, the United States will be required to finance a share of the administrative expenses and operating losses of the agreement. I can see no better way to determine American policy toward the agreement than the cold-blooded one: to weigh the probable gain in lower FASC losses against the probable loss in administrative contributions, to join if the former exceeds the latter and to abstain in the reverse event. In the interests of international comity, we should in no case join in years of export surplus and then withdraw or welsh on our delivery quotas when there is a shortage and the world price rises above the agreement one. Such double-dealing is currently ascribed (1954) to some importing countries (e.g., France), which joined the International Wheat Agreement when world wheat prices were high and refuse to accept their quotas when the Agreement price exceeds the free world price.

Bilateral Arrangements.[9] Pressure to dispose of farm surpluses by

[9] The writer has received substantial aid in preparing this section, particularly with regard to recent legislation, from a mimeographed paper by Professor J. S. Hillman which formed the basis of his essay, "Impact and Problems in Administration of Export Programs," *Jour. Farm Econ.*, February, 1955, pp. 96-109.

bilateral arrangements with importing countries is at least as old as the early twenties. For example, Senator George W. Norris introduced a bill into the 67th Congress (1921-23) establishing a 100 million dollar government corporation to buy farm products for cash in the United States, sell them abroad for foreign bonds, and then market the bonds in the United States. (Benedict, *op. cit.*, page 207.) A wide variety of such arrangements has been attempted. Unlike Nazi Germany and Soviet Russia, the United States has abstained thus far from large-scale direct barter agreements in specific commodities, but postwar legislation has been edging closer to the Nazi-Soviet model. During the Hoover administration, however, the Federal Farm Board not only sold wheat (to Germany and China) below world prices, but also bartered 25 million bushels for Brazilian coffee (*ibid.*, page 334). (This occurred prior to the Nazi elevation to power in Germany!)

The American bilateral arrangements have been of three general types:

1. "Tied loans" by the Export-Import Bank and other institutions, to finance purchases of American agricultural products (particularly cotton) for dollars at domestic prices. These have been part and parcel of American trade policy since the Export-Import Bank was founded in 1934. Even prior to the founding of the Export-Import Bank, the Reconstruction Finance Corporation made a tied cotton loan to the Soviet Union (*ibid.*). Foreign aid legislation since the first Economic Co-operation Act of 1948 has arrived at the same tying principle by indirection, the key provision being that no funds be used to finance purchase from third countries of agricultural products in surplus in the United States.

2. Earmarking of portions of American economic grants-in-aid, first to Europe and later to underdeveloped countries elsewhere, for purchase of surplus American farm commodities for dollars. Until 1953, purchases were at the domestic American price or the Commodity Credit Corportion acquisition price, whichever was the lower, but Section 550 of the Mutual Security Act of 1953 permitted sales at lower prices under bilateral agreements with the approval of the Department of Agriculture.

3. Sales of surplus American agricultural commodities for foreign currencies, which are then devoted to off-shore procurement of military goods and for purchase of strategic materials. The goods are ostensibly sold at domestic price equivalents in the absence of specific agreements authorizing lower prices, but the foreign-currency equivalents are often computed at unrealistic "official" exchange rates in such wise that a substantial discount enters the transaction in fact even when it is concealed on the surface. The most recent legislation on foreign surplus disposal, the Agricultural Trade Development and Assistance Act of

1954 (Public Law 480, 83rd Congress; approved July 10, 1954; 68 U. S. Stat. 454-59), is of this type.

Pedantically speaking, products sold abroad under these schemes include more than actual surpluses in public hands. They include, also, stocks which would have entered into surplus if not sold abroad. They include commodities like dried fruit, for which no price support or surplus accumulation program is in effect. It seems nevertheless permissible as a simplification to include all these categories as elements of surplus. Even in the most questionable category—products not under the price support umbrella—inclusion in bilateral arrangements seems to have been intended as a substitute for more direct government support of domestic prices.

Under all these programs, the enabling legislation includes a proviso against interference with normal American exports, with world market prices, and with the marketing of the agricultural produce of "friendly nations," including presumably the importing countries themselves. A friendly nation is defined in Section 107 of the Agricultural Trade Development and Assistance Act of 1954 as "any country other than (1) the U.S.S.R., or (2) any nation or area dominated or controlled by the foreign government or foreign organizations controlling the world Communist movement." If these provisos were never ambiguous and always taken seriously, they would limit the scope of these programs almost entirely to short-term emergency aids. Such, if I understand his essay correctly, is one of Hillman's criticisms of these programs: except under emergency conditions, they are so hedged in by these limitations as to be of insignificant quantitative importance. Hillman (*op. cit.*, Table 2) presents Department of Agriculture figures indicating a total of 245.1 million dollars of authorizations under Section 550 of the Mutual Security Act of 1953 for thirteen countries through July 8, 1954. During the same period approximately, total surplus holdings of the Commodity Credit Corporation rose by 2,633.0 millions, or ten times as much!

On the other hand, these limiting provisos are ambiguous and may in fact be disregarded at administrative discretion. They have been disregarded in the past, particularly as they protect foreign and not American agriculture. They have been disregarded either through ignorance of administrators or through political pressures upon them. It is safe to assume occasional disregard in the future as well. If the protective provisos are disregarded, more substantial surpluses may move under these programs at the price of increased international ill will and possible international retaliation.

The present (1954-55) rice situation in Asia illustrates the ambiguity involved and the leeway for administrative discretion. Since 1945,

American rice exports have risen from a prewar average of 80 thousand tons a year to 800 thousand tons in 1953. Much of the increase went for relief purposes; Japan was the principal recipient under bilateral arrangements. The program did not prevent a steady rise in world rice prices. The three leading prewar exporters had been Burma, Thailand, and Indo-China. For seven years following 1945, exports from both Burma and Indo-China were hampered by war damage and civil conflict. Beginning in 1953, however, Burman recovery turned rice prices downward. Continued pre-emption of the Japanese import market by the United States through 1955 may mean not only a break in world rice prices but also years of delay in the development projects of Burma and Thailand, which are financed largely by profits on rice exports, and a shift of Burman "neutralism" in an anti-American direction. At the same time, rice is one of the six "basic" commodities of American farm price policy. About 1.4 million bushels are expected to pass into surplus from the record 1954 crop. (Cf. "Too Much Rice in Hungry Asia," *Business Week,* November 6, 1954, pages 142-145.) Domestic political pressure has been strong for requiring Japan to import primarily from American surplus stocks as a condition for receiving American economic aid, since such action appears a passive matter of maintaining an American rice export market against Burman competition rather than as active matter of expanding American exports to areas traditionally served by Burma. Burma has previously never been an important source of rice for Japan except when the Japanese or Korean crops failed. In the decade following 1930, Japan obtained nearly two-thirds of her necessary imports from Korea, and approximately one-third from Formosa. (Cf. Jerome B. Cohen, *Japan's Economy in War and Reconstruction* [University of Minnesota Press, 1948], pages 368 f.)

Since the above paragraph was written, a draft Japanese-American aid treaty has been released to the press, according to which American pre-emption of the Japanese grain import market will be concentrated in rice substitutes (wheat and barley) rather than rice itself. This solution will dispose of American wheat and barley rather than rice surpluses. It will avoid economic conflict with Burma but will be resented by producers of rice substitutes (chiefly sweet potatoes) within Japan's domestic economy.

It is conventional to denounce bilateral arrangements in the interests of multilateral international trade. I follow this convention to the extent of omitting bilateral arrangements from the general surplus disposal program outlined here. There are, however, two sets of circumstances under which bilateral arrangements seem to have some legitimate place in a surplus-disposal program, however multilateral may be

our final or even our immediate ends. These circumstances can be spelled out explicity as "reservations."

1. A "distress" reservation. We agree on the permissibility of gratuitous gifts of agricultural surpluses to meet major, acute emergencies abroad. If the greater includes the less, it seems equally permissible to sell the same agricultural products at cut rates, to sell them for overvalued currencies, or to barter them for overvalued exports of the distressed countries, if the emergencies are less acute than those calling for international charity. But such sales should be permitted only with the agreement of other major exporters of the agricultural products concerned. In the Japanese rice deficit, no bilateral arrangement between the United States and Japan should go into effect without the approval of Burma, Thailand, Viet-Nam, and Cambodia, the principal rice exporters of the Far East.

2. An "inconvertibility" reservation, which can be illustrated from the recent history of Japanese cotton imports. Suppose American cotton cheaper than Pakistan cotton in Japan at existing official exchange rates, but suppose the Japanese pressured by sterling bloc regulations to purchase the more expensive Pakistan product. (Japanese sterling balances are freely available to purchase cotton from Pakistan, a sterling bloc member, but not to purchase cotton from America, which is not a member.) A dollar loan to Japan, even if tied to purchase of American cotton, is then less an interference with multilateral trade than it is a restoration of multilateral trade in retaliation against an interference by the sterling bloc.

Summary. While a candidate for his first presidential term in 1932, Franklin D. Roosevelt delivered his major agricultural policy address at Topeka, Kansas. He set forth in this address the requisites of an ideal farm program—which were not always to be met during his own administration. But the ideal is stated clearly, and we can use it as a kind of yardstick against which to measure the proposal just outlined.[10]

Roosevelt said that the ideal plan should provide for the American farmer the benefit of the domestic market without causing him to increase production. This proposal comes close to meeting this specification with regard to export commodities during periods of prosperity, when equalization fees are high. It falls short during depressed periods, when the fees will usually be lower and FASC losses met out of the general fund. While not positively encouraging farmers to leave the farm when there are ample opportunities outside, it does not encourage

[10] Franklin D. Roosevelt, *Public Papers and Addresses* (Random House, 1938), Vol. I, pp. 693-711. Cited by Benedict (*op. cit.*, p. 273), who suggests that Roosevelt may have framed his ideal with special attention to the domestic allotment plan.

them to stay there; it encourages them to stay where they are when unemployment is reducing alternative opportunities in industry.

Roosevelt said that the ideal plan should be self-financing. To current ways of thinking, self-financing is less obviously a virtue than it seemed in 1932. Our proposal, however, seems self-financing when it is desirable on fiscal grounds for it to be self-financing. It is not self-financing in periods when fiscal theory suggests monetary expansion through federal deficits.

Roosevelt said that the ideal plan should not use any mechanism that would cause retaliation on grounds of dumping. This proposal does involve the name of dumping, as does any other proposal to hold the domestic above the world price. On the other hand, it avoids one of the most undesirable features of dumping; namely, erratic and unforcecastable onslaughts upon the world price level. Also, in view of the inelastic domestic demand for most farm products, the depressive effect of this plan upon world prices seems little more than would result from American exports in a free market with no protection for the domestic American price. As an additional feature, the plan encourages American participation in international agreements including both exporting and importing countries, and designed to insure both groups against the consequences of price fluctuations. Roosevelt said that the ideal plan should be voluntary. This plan is voluntary, at least in form, which may have been all Roosevelt had in mind.

Roosevelt also said that the ideal plan should make use of existing agencies and should operate on a co-operative basis. The restriction to existing agencies beats strangely upon ears attuned to Roosevelt's subsequent alphabetical extravaganzas, but I find it not unreasonable; my proposed FASC is little more than the existing CCC (and many a predecessor) reinitialled. "Operation on a co-operative basis" means that operating farmers should have a leading voice in the administration of the plan. Participation by farmers is good politics; it is apparently as easy to erect a window-dressing of dirt and dirt farmers for one plan as for another.

I cannot claim an "A" rating in agricultural economics for these random ideas by the rigorous Roosevelt standards of 1932, even ruling out such standards as I cannot accept. But I think I can hope for a "B," or at the very least a "graduate B minus." Even that would not be too bad, "for an ignorant man and a general economist."

DISCUSSION

D. GALE JOHNSON: In his "modest proposal," Bronfenbrenner has specified two conditions for the appropriate behavior of the United States if and when it dumps or dribbles its agricultural surpluses. One condition is that we should never sneak up on our adversaries, i.e., competing producers, but should let them know in advance that we are going to clobber them, what we are going to clobber them with, and how hard we are going to clobber them. The other condition is that Uncle Sam should play as small a role as possible in financing the dumping; US farmers should, under conditions of expanding GNP, pay part or all of the cost of the dribbles. In other words, in this competitive battle for export markets, the US should not allow her farmers to bribe the referee unless it is necessary to do so. Thus in this new set of Marquis of Queensbury rules for the dumping arena, it is not cricket to sneak up behind one's opponent and bash his head in without letting him know you are going to do it nor should the fantastically large resources of the US Treasury be used to make it certain that there cannot be a fair battle between US farmers and those of competing nations.

In my opinion, if we are to continue our foreign surplus disposal operations, there is no question that a set of rules or guides to appropriate conduct should be followed. On the whole—and not arguing that there have been no exceptions—it would appear that the administrators of our surplus disposal programs since the end of World War II have followed a code of behavior that has tended to minimize the undesirable side effects of our dumping operations. It has generally been fairly well known what our export price will be for wheat—the major commodity subject to export subsidization. And administrators have shown considerable restraint in using the omnibus authorizations such as contained in Section 550 of the Mutual Security Act or the more recent Agricultural Trade Development and Assistance Act of 1954.

Despite the past restraint and general good sense that has been shown in the administration of export disposal programs, I agree with Bronfenbrenner that a procedure should be adopted which minimizes the degree of uncertainty attendant upon such operations.

As a transition to my brief comments on Heady's paper, let me twit Bronfenbrenner for accepting a Galbraith economic preconception which turns out to be a misconception. Our "ignorant man and general economist" seems to accept the idea that relative prices have little or no effect upon the allocation of resources in agriculture since it is difficult to find farm products which are being "underproduced" because of the "overproduction" of those whose prices are being supported. What, pray tell, is a sensible definition of underproduction? Unless the government intervenes, in a competitive industry the amount produced or supplied is approximately equal to the amount demanded at some price. The price of beef cattle is not supported nor controlled by government action. How could one detect whether beef is being underpro-

duced? Since one cannot define underproduction in any sensible manner, it is perhaps not surprising that it is difficult to find it. After all, who can find the black cat in the dark room when the black cat isn't there anyway?

What is important here is the elasticity of the supply of agricultural output as a whole and of the various individual farm products. The implication of Galbraith's preconception is that all such elasticities are zero or so near to zero that the difference is unimportant. Heady would not accept such a view and the reasons he gives are convincing to me, which is hardly surprising since I was already convinced.

Heady's paper does much, in my opinion, to dispel the notion that agricultural output is so inflexible—the elasticity of supply so low—that disaster would strike agriculture if an attempt were made to relate agricultural prices to market demand and supply relationships, such as is encouraged in a forward price proposal or even actual free markets. But it is pertinent to point out that a low price elasticity of supply, either for one or all agricultural products, is not necessarily a calamity so great as to justify any measure designed to stabilize farm income. The responsiveness of farm prices—and thus of farm income assuming a low price elasticity of supply—to changes in the level of national economic activity is a function jointly of price and income elasticities of demand and price elasticity of supply. Thus the elasticity of farm prices with respect to changes in national income is equal (assuming constant elasticity functions) to the income elasticity of demand divided by the sum of the price elasticities of demand and supply. Since the numerator is generally quite small and in any case not much larger than the price elasticity of demand, the low supply elasticity does not necessarily imply that farm incomes will be more unstable over the business cycle than the incomes of other producers, even producers of those products with a perfectly elastic supply function.

It is true, of course, that when demand declines for reasons other than a decline in national income, the low price elasticity of supply is a curse if it is accompanied by a low price elasticity of supply. A similar statement may be made when the supply function shifts due to variables beyond the control of man.

Don Kaldor: Most American economists have been well nutured in the virtues of international specialization and trade. Among agricultural economists few have felt comfortable about farm programs that drive a wedge between internal and external prices. Consequently, it is a rare occasion when we hear one of our professional colleagues purpose a program of export dumping as a long-range solution to the farm surplus problem.

Professor Bronfenbrenner has presented a streamlined version of the old McNary-Haugen plan with its two-price system and equalization fee. The new version incorporates several additional features, however. It requires advance public announcement of specific export sale schedules. It lays down a general rule for determining the quantity to be offered. Losses on export sales would be financed by public funds and an equalization fee levied on producers. The proportions would be adjusted according to some measure of the deficiency in

aggregate demand. It provides for flexible tariff rates, and for certain restrictions on the use of bilateral agreements.

On the whole, these new features make a substantial improvement in the original plan. The provisions covering export sale schedules would help to reduce uncertainty and add some order to the disposal process. The suggestions on financing recognize the role of expenditure in generating income and the opportunity to induce a countercyclical effect. The restrictions imposed on the use of bilateral agreements recognize some, but not all, of the effects which export dumping can have on our international relations. But why impose these restrictions only on bilateral arrangements for export dumping? Since the objectives of the proposal are not made explicit, some question can be raised about the alleged advantages of flexible tariff rates. Under the assumptions made, any addition to domestic supply resulting from imports would necessitate an equal increase in the quantity dumped abroad. Therefore, encouraging low-cost production in exporting countries could not produce any direct gain for the US economy. Any gains made possible by lower costs would accrue to other importing countries. Nevertheless, as export dumping programs go, the proposal has considerable merit.

In setting the stage for his recommendations, Professor Bronfenbrenner warns against simplifying the issues by assuming as our goal of international economic relations a set of free competition and free-trade policies. But is the critical question really one of free competition. I suspect most economists are more concerned about the effects of export dumping on allocative efficiency than on free competition and free trade per se. The important question seems to be whether we are going to sacrifice some of the gains from a better allocation of resources implicit in a long-range dumping program.

Competitive markets are an institutional device for co-ordinating and integrating economic activities. When competition is perfect, the conditions for allocative efficiency are automatically satisfied. However, if competition is imperfect, a closer approximation to allocative efficiency might be achieved under arrangements involving a greater degree of government influence over the administration of resources. The condition that internal and external commodity values be related is a requirement of allocative efficiency, not free competition. Perhaps Professor Bronfenbrenner is saying that we should not be too concerned about over-all allocative efficiency.

He suggests that we focus on a new kind of multilateralism, one that involves competition between countries (which apparently means governments), but not international competition between producers and consumers. Does he mean that we ought to forget about the gains from a more efficient allocation of resources in world production and concentrate on the strictly short-run gains from exchange? Is it not true, however, that the gains from international specialization in production are really the significant ones?

The point is made that world prices would be much the same with export dumping as with free domestic markets. In the short run, this is likely to be true with commodities such as wheat and cotton. Under export dumping, however, there is likely to be a smaller long-run effect on domestic production.

When we are concerned with allocative efficiency the output effects become important. But free market pricing may not be sufficient to induce the amount of adjustment needed to establish a long-run balance. Export dumping, like other beggar-my-neighbor policies, tends to shift the burden of adjustment to other countries. It provides a powerful incentive to retaliation and economic warfare. Moreover, it is inconsistent with our postwar efforts to strengthen the free world.

Why has Professor Bronfenbrenner cast his solution to the farm surplus problem in an export dumping mold? The answer he gives is that other solutions fail to meet the test of political acceptability. Accordingly, he has excluded from consideration all solutions involving changes in support prices, adjustments in production, subsidies, and nutritional programs.

These techniques, as well as export dumping, all have been used to deal with problems of excess market supply. The emphasis placed on each has varied with changes in Congressional restrictions, the size and nature of the problem, technical suitability, and other factors.

What role does Professor Bronfenbrenner assign to his proposal? Is it conceived as an exclusive surplus control program? If the answer is no, is it considered a marginal program—one to be used only when other programs fail to eliminate a surplus? The answers to these questions have a bearing on its quantitative effects.

The proposal is designed with an eye to the storable products. Wheat and cotton are two of the three commodities mentioned. They are also the commodities that have been in most trouble under the support programs. Between 1951 and 1954, wheat stocks increased 250 per cent and cotton stocks rose 240 per cent. A decline in export demand was largely responsible. But during the past year important production adjustments have been made in wheat and cotton.

Under the marketing quota programs, almost 19 million acres have been diverted to other crops. Further diversions are planned or in effect for the coming year. With average weather conditions in 1955, wheat production is expected to fall short of meeting foreign and domestic demand at near current prices. These adjustments in production will go a long way toward correcting the recent short-run disequilibrium in the markets for these products. What is more, they were politically acceptable.

Obviously these programs are shifting the burden of adjustment to other crops. Since a large part of the diverted acreage has gone into feed grains and pasture, the effects ultimately will be transmitted to livestock. However, most of the commodities involved are not subject to mandatory price support. The Secretary of Agriculture already has announced reductions in support levels for a number of the commodities affected. Will lower prices prompt new Congressional action? Will it mean a general control program, a program to subsidize consumption, use of direct payments, greater reliance on export dumping, or some combination?

Recent passage of the Agricultural Trade Development and Assistance Act of 1954 might suggest that the emphasis would be on export dumping. This

was enacted by a Republican controlled Congress, and the Republicans traditionally have not been very international-trade-minded. On the other hand, the same Congress passed the Agricultural Act of 1954 which provides some flexibility in support levels for basic commodities beginning in 1955. What the new Democratic Congress will do to this legislation remains to be seen. But it would not be too surprising if it placed less emphasis on export dumping and more on production control.

At the present time, general use of direct payments is on the politically unacceptable list. However, their popularity seems to be on the increase. The recent Republican Congress authorized direct payments as a method of support for wool. This is an interesting development in view of the close association of this method with the plan proposed by Mr. Brannan. Currently, nutritional programs, except for school lunch and relief donations, do not have widespread support. But who can say with assurance what methods will be politically acceptable in the future. If broadly conceived and effectively carried out, the new farm and home planning program may prove to become an important adjustment mechanism.

Designing an optimum dumping program is a legitimate analytical problem, given the objective to be maximized and the restrictions to be imposed. But it would be unfortunate indeed if we were to confine our analyses and discussions of farm policy to what momentarily might appear to be politically expedient. As long as there are gaps in people's knowledge and imperfections in our system of representative government, we should not be overly concerned about immediate political acceptability.

LONG-TERM TRENDS IN INTERNATIONAL TRADE

SECULAR MOVEMENTS IN THE TERMS OF TRADE

By ROBERT E. BALDWIN
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Interest in the problem of economic development has stimulated the study of long-run shifts in international terms of trade. The major purpose of these investigations, of course, is to analyze the economic forces which have caused the observed movements in these trading terms. However, before this analysis can be pursued with clarity and accuracy, two questions must be answered. First, what is the significance in a real income sense of the various measures proposed as indicators of the concept, "terms of trade," and what are the comparative merits of these measures? Secondly, how well do actual trade statistics measure these various analytical concepts? This paper is concerned with these two questions.

Concerning the matter of the real income or "welfare" implications of shifts in the terms of trade, the general position of major writers from at least the classical period to the time of Professor Taussig has been that a change in the terms of trade is presumptive evidence of a change in the amount of gain from trade.[1] Indeed, a rise in the ratio of export prices to import prices for a country has long been designated as a "favorable" shift in this price ratio. However, it should be noted that these earlier economists generally added that the presumption is subject to the absence of certain countervailing factors.

Although modern authors in international trade theory such as Professors Viner and Haberler are considerably more cautious concerning the welfare significance of changes in the terms of trade, there is still a large group of writers who are prepared to attach significant welfare connotations to movements in the usual measures of the terms of trade. The literature is full of references to the real income hardships which industrial nations will face if the ratio of their export to their import prices declines in the next twenty-five or fifty years. And the representatives of the underdeveloped countries also have been ready to proclaim the welfare implications of the past trend in the terms of trade. The following remark by the Chilean delegate to the Economic and Social Council of the United Nations (as reported on page 329 of the *Official Records*, Fourth Year, Session 8, 1949) typifies one posi-

[1] Jacob Viner, *Studies in the Theory of International Trade* (New York, 1937), p. 555.

tion: "But the deterioration, over a long period, of the relation between prices of raw materials and those of manufactured goods must be borne in mind. The result was a constant decrease in purchasing power and capacity for development in the countries producing raw materials."

In view of this wide association of the terms of trade with the concept of economic welfare and also the warnings of most outstanding theorists in international trade that there are some limitations on the employment of this measure for such purposes, it may be useful to analyze the welfare meaning of changes in the terms of trade a little more carefully. The early classical writers refer to the terms on which a nation trades by comparing the number of units of productive services of a foreign country whose product exchanges for the product of one unit of the productive services of the home country. Being dominated by a real-cost theory of domestic value (although asserting its inapplicability in the international sector), it was only natural for the classical writers to express the terms of trade in this fashion. Professor Viner called this measure of the terms of trade the "double factorial trading terms" (*op. cit.*, page 561), while Professor Robertson has labeled them the "true" terms of trade ("The Terms of Trade," *International Social Science Bulletin,* Spring, 1951). However, since these early writers generally assume constant and historically stable costs, they frequently use the commodity terms of trade, i.e., the ratio of export to import prices, as a shorthand representation of changes in this more fundamental concept. Today this is the measure which almost invariably is utilized in statistical analyses of international trading terms.

Early writers relate changes in the terms of trade to changes in real income in only a general way. Ricardo, for example, argues that the gains from trade consist of an increase in the mass of commodities and therefore in the sum of enjoyments, and he merely implies that an increase in the ratio of export to import prices leads to an increase in these enjoyments. However, J. S. Mill, who has exerted a powerful influence on subsequent study in this field, goes much further (*Principles of Political Economy,* Book III, Chapter 18). He wishes to measure the gains from trade exactly, in order to explain the manner in which these gains are divided among the trading parties. Taking a simple two-commodity–two-country model, Mill asserts that the differences in the opportunity cost ratios between two countries is an index of the total gains from trade. Therefore, the relation of the commodity terms of trade with these cost ratios shows the manner in which this total gain is divided between the two countries.

It should be noted that Mill is concerned with changes in the division of trading gains, not changes in the absolute gains to each party.

Only if the cost conditions remained the same in each country would he be willing to correlate the two. For example, when he assumes an increase in productivity in one of the countries and discusses the possible resultant deterioration in this nation's trading terms, he refrains from asserting that the country has suffered an absolute loss. Mill seems to recognize quite clearly here the inadequacy of a change in the commodity terms of trade as an index of a change in the absolute gains from trade.

Mill, of course, realizes that in order to connect the terms of trade and real income, one first of all needs a method of measuring changes in a nation's welfare. Moreover, for Mill the task is made especially difficult, since he wishes to explain how the total gains from trade are divided among the trading parties. Therefore, he needs an absolute measure of trading gains.

His particular measure of these gains, i.e., differences in opportunity cost ratios, is entirely unacceptable to present-day economists. It inadequately accounts for both the total utility derived from consuming various combinations of the two commodities and the total disutility involved in producing the items.

Moreover, almost all modern economists feel that there is no completely satisfactory manner of accounting for these factors and thus for measuring changes in real income or welfare in an absolute sense. Today, it is usually assumed that utility can only be measured in an ordinal sense. Thus, modern welfare economists only make statements concerning the direction of a welfare change, and then only under rigid assumptions. For example, as far as a country is concerned, it is said that, if tastes remain constant and if there are more of all commodities (or more of some and no less of others) in one position than in another, this indicates a potential increase in real income. The word potential should be stressed, since the question of the distribution of income bars any outright statement unless assumptions concerning interpersonal utility comparisons are made. Of course, if tastes change, they would not make even this weak statement.

In view of these objections, Mill's use of opportunity cost ratios as an index of the gains from trade and the commodity terms of trade as an indication of the way gains are divided must be rejected. Furthermore, the whole theoretical concept of the gains from trade is of little practical significance. All agree that the concept deals with the difference in some welfare sense between the collection of goods a nation actually produces and consumes with the existence of trade and what it would produce and consume in the absence of trade. Setting aside the problem of finding a measure of absolute welfare, it still would be impossible to determine the no-trade position in actual practice. The only

concept that one can discuss in the real world is a small change in a country's real income as the actual trading situation varies. Such changes can be quite different from a change in the theoretical meaning of the gains from trade.

The basic classical concept of the terms of trade, i.e., the double factorial terms, makes intercountry comparisons of these actual real income changes in the international sector. If one country's double factorial terms improve and thus its trading partner's (assuming there is only one) deteriorate, the interpretation is that the first country has gained more (or lost less) than the second country. This, of course, rests on the assumption that the welfare change of one country can be compared with that of another. But if we assume for the moment that utility is measurable in a cardinal sense and comparable among countries, this measure could give the wrong answer. For example, taking two countries (treating them as individuals), two commodities, and assuming that both countries have the same tastes, it is quite possible that if one of the two countries suffers a deterioration in its double factorial terms of trade—resulting, say, when there is a proportionate increase in productivity in the export industry of each country—this country could increase its utility more in a cardinal sense than the country reaping the better terms. For, while the country with the improved trading terms increases its imports (in physical terms) proportionately more than the other nation, this does not mean its utility for these imports increases more. One should not assume cardinal utility changes are proportionate to quantity change.

Professor Prebisch, for example, appears to illustrate this misleading type of conclusion when he complains about the secular fall in the commodity terms of trade of the underdeveloped countries. (United Nations, Department of Economic Affairs, *The Economic Development of Latin America and Its Principal Problems* [Lake Success, 1950].) He argues that, even though productivity in the export industries of developed nations has increased faster than that in underdeveloped countries, the commodity terms of trade have moved against the peripheral nations. Therefore, he concludes, "while the centers kept the whole benefit of the technological development of their industries, the peripheral countries transferred to them a share of the fruits of their own technical progress." Quite clearly he means that the real income gains through trade in the peripheral countries have not been as great as in more developed nations. But, accepting his assertion on the actual movement of the commodity terms of trade, his conclusion by no means necessarily follows. A major reason for the declining export prices of the peripheral countries relative to the export prices of the center would seem to be a high price and income demand elasticity for manufactured

products and a low price and income demand elasticity for primary commodities. The peripheral countries together with the industrial nations helped to keep up the prices of industrial commodities by their comparatively large increases in demand for these goods as real income rose. Although the quantity of imports of industrial nations rose relatively more than those of underdeveloped countries, perhaps the result would be that the latter group received a greater increase in utility for their imports than the developed nations, if these utilities could be measured in a cardinal sense and could be compared.

While most economists are reluctant to employ terms-of-trade measures such as the double factorial as indications of the relative trading gains among nations, many seem willing to give meaning to shifts in the terms of trade merely as an index of changes in the direction of a particular country's real income position. The commodity terms of trade, the income terms of trade, and the single factorial trading terms are examples of measures utilized for this purpose. But there are severe limitations on the range of welfare statements that can be made on this level without selecting some social welfare function for the country. Moreover, even with such a function, none of the above measures always indicates the direction of change of a nation's real income as affected by foreign trade. Nevertheless, there are differences in the merits of these various terms-of-trade concepts for long-run studies, given some judgment concerning the distribution of income within the country and thus a well-defined social welfare function.

Changes in the commodity terms of trade can be completely misleading. Frequently, a country, such as Great Britain during the first half of the nineteenth century, has been carried into international prominence on the wave of a secular decline in its commodity terms of trade. And the history of many a successful business is one of striving for more unfavorable terms of trade. The point, of course, is that the commodity terms of trade fail to take explicit account of changes in export productivity and changes in the volume of exports.

The influence of classical thinking is too great in regard to this matter. In their international trade analysis these writers generally assume, first, a constant supply of resources operating within a given state of technology and, secondly, a purely competitive, fully employed, domestic economy where all the optimum marginal conditions are satisfied. Under these conditions, a change in the export-import price ratio has some claim to be considered as an indication of a change in a country's real income in the international sector. But these assumptions are completely inappropriate for long-run analysis and, for that matter, even for most short-run analysis. Take the matter of the optimum conditions. Obviously, every factor does not earn the same return in all

of its possible different uses in both the developed and, particularly, the underdeveloped nations. A country may expand its exports partly by drawing on factors in less productive employments, incur an unfavorable movement in its commodity terms of trade, and still raise its real income significantly. This has been a frequent pattern of economic development. To study the long run with a series which can give a rough idea of what is happening only when population, capital stock, and the state of technology remain the same is equally misleading.

Another aspect of the static classical model is that it ignores the dynamic repercussions of the international sector on the domestic economy. An increase in the importation of some item essential to domestic development may force import prices up and cause a temporary decline in real income. But the long-run effect of these imports may be to add greatly to the real income in the domestic sector of the economy. In brief, a change in the commodity terms of trade is a useful indication of a change in real income as affected by foreign trade only if all other things remain the same. But in the long run, changes in the commodity terms of trade frequently are accompanied by other changes in the international sector which counter the real income effects due merely to changes in the commodity terms of trade. To concentrate upon the terms-of-trade element in real income and to exclude other relevant variables is highly inappropriate in analyzing long-run shifts in real income.

The widely expressed view on the part of the representatives of the underdeveloped countries that measures must be taken to stop the secular decline in their commodity terms of trade may well lead to disastrous policy decisions. And the same applies to those in the developed nations who seem obsessed by a fear of long-run deterioration of their commodity trading terms.

The obvious limitations of the welfare conclusions to be drawn from changes in the commodity terms of trade have led to a number of alternative measures designed to rectify these drawbacks. One measure, which can be computed quite as easily from the available statistics on trade as the commodity terms, is an index of the total value of exports divided by an index of import prices. This indicates changes in the volume of imports which can be purchased through the export trade. It has been termed by Viner as the total gain index (*op. cit.*, page 563); by G. S. Dorrance as the income terms of trade ("The Income Terms of Trade," *Review of Economic Studies*, 1948-49, No. 39); and (perhaps most appropriately) by the Economic Commission for Latin America as the capacity to import (Secretariat of the Economic Commission for Latin America, *Economic Survey of Latin America, 1949*). However, while it must be granted that a recognition of the volume of trade

is important for an appraisal of trading gains, the attempt to combine this element with the price element in a single composite measure can lead to quite incorrect conclusions as a measure of the direction of real income charge for a country. For example, if the export price level remains unchanged while the quantity of exports increases and the price of imports also increases proportionately, the index will not change. Yet simple, static indifference curve analysis tells us that these are precisely the conditions under which an individual would be worse off. *Ceteris paribus,* a rise in this index could mean either an improvement or worsening of a country's real income position. For this reason it is a poor measure of real income shifts.

Another measure, which attempts to include the influence of productivity in determining the direction of gains, is the single factorial terms of trade: the commodity terms of trade multiplied by an index of the productivity of the factors of production in the export industries. Professor Robertson *(op. cit.)* feels that this measure is the one best suited for a discussion of changes in a country's real income as affected by foreign trade. One problem with the concept, as has been stressed recently by Ely Devons, who has statistically measured the single factorial trading terms for the United Kingdom over the last twenty years ("Statistics of the United Kingdom Terms of Trade," *The Manchester School,* September, 1954), is the ambiguity associated with the term, "the productivity of a unit of the factors of production." It is difficult to define. This obstacle, of course, also is present with the double factorial terms of trade. Efforts in this field have been confined to measuring the productivity of labor—the measure Devons employs—and are not entirely satisfactory for the purpose. However, even if this measure is used in computing the single factorial terms of trade, an investigator is faced with a lack of adequate data in this area for anything but recent years. Furthermore, like the other measures, this one cannot always reflect the true direction of welfare change, even treating a country as an individual with well-defined indifference curves. It should be noted, however, that the last two measures of the terms of trade can rise and fall for everyone simultaneously.

Do all of these objections force one to the conclusion that all efforts to discuss the effects of long-run changes in foreign trade on real income should be abandoned? I would say it does not. Modern welfare economics does not conclude that almost all efforts to measure changes in real income are futile. It merely points out that on the basis of very weak value judgments, which are almost universally accepted, one cannot go very far in making definite statements. But there are many stronger value judgments involving assumptions concerning interpersonal comparisons of utility which are acceptable to the large majority

of policy-makers and affected parties and under which many definite welfare statements can be made. The economist must employ these judgments, if he wishes to have a significant role in policy making or in interpreting history in anything but a rather trivial sense. (Judgments concerning the welfare significance of new commodities and changes in tastes are also necessary, if any definite statements are to be made.) However, he should explicitly state these judgments and also point out the welfare conclusions which follow from different sets of these interpersonal utility value judgments. Then the reader can make a conscious choice in deciding what real income conclusions he wishes to accept. Too often both the writer and the reader are not consciously aware of the value judgments upon which the conclusions entirely depend.

These remarks, of course, are relevant to all studies of changes in real income. But, as has been noted, the investigator in the terms-of-trade area is faced with additional difficulties associated with the narrowness of his topic. It would seem to me that what little information can be gleaned from the foreign trade sector should not be further constricted by merely studying the ratio of export to import prices. It does make a difference to a nation whether its import or its export prices are changing; to withhold the knowledge of this information from the reader by presenting only a ratio (as is often done) appears unwarranted in view of the limited significance of changes in the ratio. Furthermore, a study in this field should be implemented by the use of export and import volume indices, productivity changes in the export and internal sectors of the concerned economies, and the host of other economic indicators which help to make up a comprehensive study of the total economy. In other words, we should not concentrate merely on the international sector if we wish to make meaningful statements about real income changes which are caused by foreign trade. The total economy should be studied in the context of a dynamic, non-optimum view of the development process. Nor should volume and productivity figures be combined with price data into single ratios. They can all be misleading. Certainly every bit of what can be seen by these ratios can be discovered without them, plus a good deal more.

It should be noted that these criticisms relate to the employment of the various terms-of-trade measures as indicators of long-run gains in foreign trade. There are, of course, other purposes for which these ratios are used—such as in studying balance-of-payments problems and capital movements. For such purposes these measures may serve as useful tools. However, in such analyses, the limitations of these concepts as real-income measures should be explicitly stated.

In addition to the many theoretical limitations involved in relating

changes in trading terms to changes in real income, there are a host of statistical problems connected with long-run studies of the terms of trade—particularly those dealing with pre-World War I figures. A major difficulty, of course, is the lack of comprehensive and accurate data. For example, Werner Schlote in his study of the foreign trade of Great Britain (*British Overseas Trade from 1700 to the 1930's* [Oxford, 1952]) employs Jevon's commodity index—an unweighted series of only forty commodities—in his computation of current import values from 1814 to 1854. This import value series, and the import price index he derives from it with the aid of a volume series, must be regarded as a very crude trade measure. Professor A. H. Imlah ("Real Values in British Foreign Trade, 1789-1853," *Journal of Economic History,* November, 1948, and "The Terms of Trade of the United Kingdom," *Journal of Economic History,* November, 1950) has pointed out some of the inadequacies of these estimates, while also doing much to improve them. But, as he notes, price and value series for these years can only be regarded as very rough measures of the true relationships.

However, the drawbacks of series used to depict trading terms for later and even quite recent years are not quite so obvious. H. Staehle ("Some Notes on the Terms of Trade," *International Social Science Bulletin,* Spring, 1951) notes that in the case of the foreign trade of the Belgium-Luxembourg Customs Union during 1948 where complete records (representing about 25,000 punched cards) were kept, import and export price indices varied significantly between a sample based on all commodities accounting for at least 1/1,000th of the total value and one based on 1/10,000th of total value. In other words, these price series seem to be highly sensitive to variations in coverage.

Furthermore, a price series based on a limited sample of similar commodities throughout a fairly long period, such as A. G. Silverman's index of British export and import prices from 1880 to 1913 ("Monthly Index Numbers of British Export Prices, 1880-1913," *Review of Economic Statistics,* August, 1950), tends to be biased in an upward direction because of the omission of new commodities introduced during the period examined. It is reasonably well established that the price history of a new product, relative to previously existing commodities, is one of rapid decline in its early stages of production. While new items probably do not enter international trade as soon as they do domestic trade, it would seem that the exclusion of these products from a commodity sample underestimates the relative price decline of the total commodity list. This factor, of course, applies to both import and export indices. An intensive study would be needed to determine whether the upward bias was greater on the import or the export side for a particular country in a particular period; e.g., Great Britain from

1880 to 1913. But since the composition of Britain's exports underwent a greater change than its import trade in this period, the suspicion is that this factor tends to cause a greater upward bias to export prices than to import prices.

A related point is the choice of weights in the computation of a price index. For a given array of commodities, price indices based on beginning-year weights tend to have an upward bias compared to price indices based on end-year weights if the changes in the prices and the changes in the quantities are negatively correlated, i.e., price changes result from changes in cost conditions, and a downward bias if the changes in the prices and the changes in the quantities are positively correlated, i.e., price changes are due to relative changes in demand. As R. G. D. Allen observes (*International Trade Statistics* [New York, 1953], page 195), the usual case with price indices of actual time series is that the index employing beginning-year weights shows an upward bias compared to one using end-year weights.[2] However, a study of the direction of the bias and its impact on export prices compared to import prices should be made on the widely used British figures.

Similar problems to those mentioned above also arise with the widely used procedure of computing price indices on a unit value basis. Although new commodities automatically enter the broad category groups in both the volume and actual value series, in this measure of price change, they are not weighted by their correct prices. Analogous inaccuracies also occur when there are compositional shifts within the promiscuously broad unit value categories—a frequent occurrence in any long-run series. And, of course, this index number is also subject to the relative bias problem associated with the choice of weights.

The matter of accounting for quality changes is still another obstacle to be faced in a study of the terms of trade as in almost all studies of price and quantity series. While there is no satisfactory method of handling the problem, all agree that a correct picture cannot be obtained without recognizing their great importance. In a terms-of-trade study the significance of this point lies in the generally accepted view that quality improvements have been greater in manufactured products than in primary commodities. If this is true, it tends to impart to the typical statistical measure a systematic bias which makes changes in the terms of trade of nations exporting manufactured goods and importing primary goods more favorable than they actually are. Certainly, this point applies to the example of the much-cited British data from 1870 to 1913.

[2] Viner in his study, *Canada's Balance of International Indebtedness, 1900-1913* (Cambridge, 1924, pp. 231-232), found that Canada's export price index based on beginning-year weights rose to 135.6 in the end year compared to 120.2 for the price index based on end-year weights.

A final point related to this British data is that the United Kingdom values imports c.i.f., i.e., inclusive of transportation charges, while it values exports f.o.b., i.e., exclusive of these charges. Therefore, a change in British import prices need not entirely reflect a change in the prices which foreigners received, since shipping costs on imports were in part paid by British importers to British shippers. Furthermore, on the export side there is no provision for the inclusion of British shipping services purchased by foreigners. A terms-of-trade index which included both merchandise and shipping services would give a more accurate picture of Britain's commodity terms of trade. An estimate of the importance of this point in the period 1870 to 1913 is as follows. Professor Imlah's index of net merchandise import prices fell 32 per cent and his index of domestic export prices 18 per cent between these two years. Thus Britain's commodity terms of trade rose 19 per cent (Imlah, *op. cit.*). However, net shipping earnings during this period were equal to about 22 per cent of domestic exports. Furthermore, freight rates fell about 50 per cent between these two years. (A. K. Cairncross, *Home and Foreign Investment, 1870-1913* [1953], page 176.) A rough estimate of merchandise and shipping terms of trade can be made if the import index is left as it is but shipping services are introduced in the export index. This new index increases only about 12 per cent between the two years rather than 19 per cent.

These statistical difficulties reinforce the analytical arguments urging a cautious use of long-run export and import price series. It is bad enough that the real income significance of changes in the commodity terms of trade is frequently misinterpreted, but it is even worse that the data on which these conclusions are drawn may not even indicate the true directional change. For example, it has been generally asserted that Great Britain's commodity terms of trade improved between 1870 and 1913. But an appraisal of the limitations of the statistics on which this conclusion is based leads one to doubt whether this statement is really true.

THE LONG-TERM FUTURE OF UNITED STATES IMPORTS AND ITS IMPLICATIONS FOR PRIMARY-PRODUCING COUNTRIES

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I. *Introduction*

Recent discussions of future United States imports have been largely focused on specific policy aspects: our requirements of strategic materials; "trade, not aid" as a solution—or a palliative—for the world's dollar problems; tariff policy and its relation to domestic production; etc. The present paper is not concerned with problems of United States import policy. It discusses, rather, the significance of certain prospective or inferred changes in the volume and the real value of our imports. Summarizing a series of projections made by the writer in a study prepared at the Federal Reserve Bank of New York,[1] this paper first discusses a method of estimation that is largely based on individual commodity studies rather than on aggregative trend projections. Next, the actual estimates and their implications for the United States' propensity to import and for the future of the terms of trade are taken up in turn. It will be found that both the downward trend of our import-income ratio and the deterioration of primary-product prices relative to those of manufactures have been reversed. Finally, the implications of a large increase in United States imports for the economic development of primary-producing countries will be discussed. The argument suggests that the marginal importance to developing countries of increased exports is much greater than is usually realized; moreover, the operation of a number of "multipliers" tends to raise the cumulative benefits of increases in exports far above the initial value increments.

II. *A New Attempt at Projecting the Value of United States Imports*

Methods of estimating the future demand for imports have been the subject of much professional discussion. A session devoted to this topic at the 1952 AEA meetings (*Papers and Proceedings*, May, 1953, pages 135-166) once more exemplified the difficulty of deriving elasticities and import functions from historical time series. Conceptual and statistical problems, however, are not the only obstacles. No long-range trend projection from any given historical experience can yield satis-

[1] "The Secular Increase of United States Imports and World Trade" (Balance of Payments Division, May 13, 1954, mimeographed).

factory results if the relationship between any of the basic variables is subject to significant change.

Recent investigations of our raw material base reveal that the last decade marked the beginning of a structural change that is characterized by a widening gap between the growth rates of demand and of domestic supply of several major commodities. Resulting shifts in the supply elasticities of domestic and foreign products tend to reduce or void the usefulness of rigid projections of aggregate import propensities derived from structurally different periods. The purpose of this paper is not to argue this view at length, although the traditional preoccupation with short-term elasticities has tended to divert attention from the factors involved in long-term estimation.[2] This point has had to be made, however, in order to explain the writer's tendency to rely only to the smallest possible extent on aggregative trend projections in his attempt to estimate the value of future imports.

As a partial substitute, the import values of about thirty major commodities, which account for approximately two-thirds of our imports, were individually projected. The estimation of import volumes followed closely the course adopted by the Paley Commission (*Resources for Freedom,* June, 1952) which, it will be recalled, estimated imports as the difference of projected demand over prospective domestic supply. In this respect, an important underlying assumption should perhaps be made quite explicit; namely, that import demand is in fact a residual. This implies that imports are drawn upon—even in the long run—only to the extent necessary to supplement domestic supply; in other words that, on the whole, imports are marginal to the domestic production of competing products.

This tacit assumption has found support in recent publications concerned with United States demand for imports.[3] In addition to the statistical evidence mentioned therein, this proposition actually has a solid foundation in American import policies. The interplay between protec-

[2] We really know little about long-term elasticities except that they are probably greater than in the short run. It is surprising that Professor Harberger should claim in his discussion below that demand elasticity is "well below unity." He was prominent among the economists who showed that all known methods lead to underestimation. (See Arnold C. Harberger, "Index Number Problems in Measuring the Elasticity of Demand for Imports," *Econometrica,* July, 1950, p. 275, and Fritz Machlup, "Elasticity Pessimism in International Trade," *Economia Internazionale,* February, 1950 pp. 127 ff.) Moreover, the most elaborate study of US imports yet made points to elasticities very close to or even exceeding unity, not .5 as Professor Harberger claims. (See J. H. Adler, E. R. Schlesinger, and E. Van Westerborg, *The Pattern of United States Import Trade since 1923*, pp. 70 ff.)

[3] See G. Lovasy and H. K. Zassenhaus, "Short-Run Fluctuations in United States Imports of Raw Materials, 1928-39 and 1947-52," International Monetary Fund, *Staff Papers,* October, 1953, p. 281; Arnold C. Harberger, "A Structural Approach to the Problem of Import Demand," and Hans P. Neisser, "The United States Demand for Imports," both in AEA *Papers and Proceedings,* May, 1954, pp. 146 and 154 f. Also discussion by J. H. Adler and H. K. Zassenhaus, *ibid.,* pp. 160 and 164.

tionist forces and countervailing interests and considerations has brought about a precarious, yet curiously enduring, balance. As a result, domestic producers of raw materials can count on a market for most of what they can produce within a fairly narrow range of average costs, while the economy is spared the cost of extreme protection. The dust of battle frequently seems to obscure the long-range operation of such a system of checks and balances in United States postwar policy. Sometimes, though rarely, this principle manifests itself in as explicit a fashion as the well-known recommendation of the National Petroleum Council that imports should supplement but not supplant domestic production. It appears realistic and not at all unreasonable to incorporate such a sociopolitical stabilizer as a datum into a system of foreign trade, in the form of an assumption that imports are marginal to domestic production.

Yet this relationship between domestic output and imports cannot operate independently of the price mechanism. If demand increases faster than domestic output and prices tend to rise, imports become more attractive within a given tariff and freight rate structure. Conversely, if prices fall, a specific tariff or a rigid freight component imposes a relatively greater burden on the foreign product and tends to shift the competitive advantage in favor of the domestic supplier. Similarly, the forces that make for substitution of one commodity for another can only be appraised in conjunction with price considerations. It therefore seems strange that the Paley Commission excluded relative price changes from its model, by adhering to the price structure of 1950. As the Commission was only concerned with import volumes, this assumption was perhaps not too harmful, especially since in some of the Commission's commodity studies the substitution effects of relative price changes were not entirely ignored. In projections of import values, however, relative price shifts can hardly be neglected without impairing the usefulness of the results from a realistic angle. This deficiency becomes apparent in an earlier attempt at translating the Paley estimates into value terms. (See Eugene R. Schlesinger, "The Long-Run Outlook for United States Merchandise Imports," International Monetary Fund, *Staff Papers,* February, 1954.) The choice of 1950 as a base year makes the assumption of unchanged price relations particularly unrealistic, since the Korean emergency had distorted the price structure in a singularly arbitrary manner. Whenever Schlesinger uses 1950 import values as the basis for projections, the distortions of trade volumes in that year tend to add to the disparity because the second half was already affected by the scramble for imports that began after the Korean invasion. Moreover, apart from certain recent important commodity developments, Schlesinger ignores sizable revisions in the population and

labor force estimates that have been made since the Paley report was published. As a result of such discrepancies and some differences in assumptions, my value projections range from 10 to 35 per cent higher than Schlesinger's interpretation of the volume projections in the Paley report.

On the other hand, an attempt to project commodity prices over long periods of time appears, at first sight, to face formidable obstacles.[4] Upon closer scrutiny, however, a number of specific factors tend to narrow the range of contingencies within the empirical economic framework that characterizes individual commodities. While it is not possible to summarize here the considerations set forth at great length in my earlier study, it can be said that the key to price estimation was found in the matching of the prospective domestic supply with estimated total demand, with due consideration to long-term technological trends.[5] Through numerous discussions with commodity specialists in industry and government, a fairly broad range of prices, not a single price, was established for each commodity in accordance with a fair consensus of experts, based on a partly intuitive, but to them quite tangible, appraisal of long-term cost trends in their industries. In line with the assumed marginality of imports, the lower limit of the range is determined by real domestic production costs, since the projected domestic output would not be forthcoming below a figure satisfactory to a requisite number of producers. Conversely, the upper limit of the range is reached when only a small increase of domestic output could be expected from a price rise to a point at which foreign imports would become available in sufficient quantity. Professor E. S. Mason, a member of the Paley Commission, has expressed the opinion that foreign reserves of metals are large enough to eliminate the likelihood

[4] It is essential to distinguish—as Professors Kindleberger and Morgan fail to do in their discussion below—between price estimation in the short and the long run. Daily commodity price changes are based on expectations that arise from imperfect knowledge of actual demand and supply. In the long run, supply elasticity is high and cost relationships are the prime determinant. It is therefore easier, not more difficult, to project price trends over the long term rather than for the next six months or so, especially if a reasonably broad range, not a single price, is assumed.

[5] Technological change can be projected with suitable precautions, since it is neither as erratic as Professor Harberger implies, nor as unpredictable as Professor Morgan believes. Industry experts are well aware of the "crucial technological elements in economic progress" to which Professor Harberger refers in his discussion below. The time table of technological change, especially in extractive industry, is not fortuitous but planned many years in advance. The technology of years hence has been on the drawing board or in experimental stages for a long time, and more remote possibilities for coming decades are continually explored. On the whole, very little that can become a sizable economic factor within the next twenty years is not already known in outline and thus accessible to appraisal by the experts. As Professor Harberger points out, the extent of change and its economic effects vary from industry to industry. This is why disaggregation is essential for realistic projections. The greater degree of aggregation that Professor Harberger seems to prefer would fail, precisely because we cannot expect that differential change can be "averaged" realistically and consistently.

of price increases (in real terms) during the next twenty to twenty-five years. (See "Raw Materials, Rearmament and Economic Development," *Quarterly Journal of Economics,* August, 1952, page 332.)

In the case of commodities not manufactured in the United States, similar factors that shape world supply and demand had to be substituted. For foods, the consumption of individually-projected import items was based on long-term trends of per capita consumption and on a population projection somewhat below the highest recent estimate of the Census Bureau.[6] Finally, in order to project the remaining one-third of United States imports not covered by individual commodity estimates, a modified system of trend projections was adopted, partly based on unpublished postwar coefficients computed in the Federal Reserve Bank of New York.

III. *The Outlook for United States Imports*

The Gist of the Projections. Table 1 summarizes the projections for a reasonably normal year in the 1970's when the United States gross national product would, by assumption, have reached a level of 615 billion in 1953 dollars, twice the level of 1950[7] and a modest figure in the light of recent official and unofficial estimates and targets for 1965. The value of United States imports in constant dollars about twenty years hence is estimated at from 2.5 to nearly 3 times the value of imports in 1948—the year of largest postwar imports before the Korean emergency. Using for comparison the values that are based on prices considered as "most likely" by the experts, this corresponds to an annual rate of increase of imports of 3½ to 4 per cent from 1948 to 1975. If petroleum, which accounts for 37 per cent of the projected increase during that period, is tentatively eliminated from the com-

[6] *Current Population Reports, Population Estimates,* Bureau of the Census, Series P-25, August 21, 1953, p. 5. Population in 1975 was assumed to reach 215 million. The census estimates range from 199 to 221 million, the lower part of the range being unlikely except in the case of relatively low economic activity. The highest estimate implies the maintenance of about the predepression age-specific fertility rate rather than the postwar birth rate to which Professor Mason refers in his comment on Colin Clark's population estimate of no less than 234 million in 1975. (See Colin Clark, "Afterthoughts on Paley," and Edward S. Mason, "Comment," in the *Rev. Econ. Stat.,* August, 1954, pp. 270 and 276.) According to the Census Bureau, all of its latest estimates may be considered conservative, and it will be recalled that all earlier census estimates had erred on the low side

[7] The original table included three columns under each price assumption. These alternative estimates had to be omitted for reasons of space. (While the lower volume projections reduce the import total but very little, the higher assumptions would increase total imports for 1975 in the three columns of Table 1, respectively, by 2.0, 1.6, and .9 billion of 1953 dollars.) The three price columns refer to the range of prices established by the commodity specialists; the lower and upper ends of the range are perceived by the experts as possible but not very likely, while the price designated as "most likely" carries considerably greater probability weight. It should be noted that this range represents, as it were, the significant section of a probability range, in place of a single long-run price estimate; it is not meant to delimit the amplitude of short-term fluctuations, which might well be much greater.

TABLE 1

UNITED STATES IMPORTS—1975, 1948

	1975 (In Millions of 1953 Dollars)			1948 (In Millions of 1953 Dollars*)
	Low Price	"Most Likely"	High Price	
Crude Materials and Semimanufactures†				
Aluminum and bauxite	235	256	273	62
Copper	496	453	494	214
Iron ore	400	438	508	29
Jute and burlap	143	156	168	168
Lead	149	171	193	112
Lumber	141	151	161	193
Newsprint	778	812	846	449
Nickel	186	226	266	65
Oils and oilseeds and waxes	202	217	233	174
Petroleum and products	4,969	4,989	4,730	444
Rubber	515	560	605	332
Tin	130	140	149	144
Woodpulp	288	313	325	327
Wool	465	531	605	349
Zinc	126	136	160	43
Other crude materials and semimanufactures	2,423	2,762	3,042	1,484
Total	11,646	12,311	12,758	4,589
Foodstuffs				
Cocoa	204	259	316	209
Coffee	2,064	2,279	2,494	741
Sugar	386	432	478	377
Other crude and manufactured foodstuffs	2,006	2,169	2,384	799
Total	4,660	5,139	5,672	2,126
Manufactures	2,126	2,339	2,658	754
Total imports‡	18,432	19,789	21,088	7,469

* Adjusted by US wholesale price index (for 1953 estimated at 110 5 basis 1947-49).

† Includes in 1948 manufactures of aluminum, asbestos, as well as mica, unmanufactured and manufactured. It was assumed that these imports will have been replaced by domestic items in 1975.

‡ Figures may not add to totals due to rounding.

SOURCE: 1948: US Department of Commerce, *Monthly Summary of Foreign Commerce of the United States*, January–December, 1948, page 32.

parison, the annual rate of increase of imports still remains above 3 per cent. Such a prospect appears of sufficient magnitude to encourage the following three main lines of speculation.

Growth Trends. The rapid increase of imports since 1949 for which the post-Korea import boom at first seemed to be alone responsible now appears merely to be the forerunner of sizable future growth. In fact, after the passing of the Korean emergency and in spite of a reduction of commodity prices, our imports were well maintained in 1953 and are

likely to show no more than a slight drop in 1954, our recent recession notwithstanding. In the perspective of our projections a further doubling of the recent import level by 1975 is well within the realm of possibility.

The postwar period appears to mark a distinct change in the rhythm of our imports, from a period of near stagnation to one of rapid growth. From 1926 through 1948 our imports barely grew at all in terms of constant dollars,[8] but on the basis of our projections they might increase by 3½ to 4 per cent annually from 1949 through 1975. This change of pace can be best, though only partially, understood against the background of our greater dependence on certain raw-material imports. Steeply growing imports of petroleum, iron ore, nonferrous metals, and many others are clearly in store. It is, however, noteworthy that offsetting factors are always present, so that—perhaps surprisingly—in our projections for 1975 the combined share of crude materials and semimanufactures in the total just barely rises above the 62 per cent mark reached in 1925-29. (Newsprint and burlap, classified as finished manufactures in United States statistics, were included in semimanufactures in this calculation, which was derived in current dollars from the source mentioned in footnote 8.)

The "Propensity to Import." While the Paley report foretold a rapid increase of raw material imports, it did not imply that the volume of imports would grow as fast as the gross national product. The inclusion of a greater variety of imports and the present method of projecting values instead of volumes afford an altogether different perspective. It now appears that the succession of declines of the import-income ratio that used to be considered a historic trend has been arrested and a further slight upward tendency may be expected for the future.

Since in the past much has been made of our "declining propensity to import," a few additional remarks on this issue may be in order. Table 2 presents the percentage ratio of total United States imports to gross national product in current dollars for the last eighty years and adds the ratio for 1975 implied by our projections. It appears that the historical decline took place in somewhat discontinuous steps, interrupted by lengthy periods of stability like that from the turn of the century to the Great Depression. In view of this progression, one might well wonder why this phenomenon should have been so commonly interpreted as a "secular" trend without adequate investigation into the specific factors which have been responsible for the decline in each individual historical period.

[8] Current dollars adjusted by United States wholesale price index, calculated on the basis of John H. Adler, Eugene R. Schlesinger, and Evelyn Van Westerborg, *The Pattern of United States Import Trade Since 1923* (1952).

TABLE 2

RATIO OF UNITED STATES IMPORTS TO GROSS NATIONAL PRODUCT
(In Current Dollars)

Decades	Year	Percentage	
		(1)	(2)
1869–78		7.1	
1879–88		6.0	
1889–98		5.9	
(1894–1903)		(4.9)	
1899–08		4.7	
1909–18		4.9	
1919–28		4.8	
1929–38		3.3	
	1929		4.2
	average 1937–40		2.7
	1948		2.7
	1952		3.1
	1975		3.2–3.5

SOURCES: Column (1) GNP. 1869–1918 decade estimates, 1919–38 averages of annual estimates of GNP, from Simon Kuznets, *National Product Since 1869*, Table II 16, page 119. Imports: *Historical Statistics of the United States, 1789–1945*, Column M 68, pages 247 ff.

Column (2) GNP: 1929–48 from *The Economic Report of the President*, transmitted to Congress January 14, 1953, page 165; 1952 from *Federal Reserve Bulletin*, November, 1953, page 1212. Imports for consumption 1929–40 from *Statistical Abstract of the United States, 1941*, page 527; 1948 from *Monthly Summary of Foreign Commerce*, January–December, 1948, page 22; 1952 from *Quarterly Summary of Foreign Commerce of the United States*, January–December, 1952, page 23.

One might expect that certain structural shifts which characterize the growth of the American economy would bring about a change in our import requirements. Technological displacement is frequently mentioned as a reason for lower imports, but this argument can be overdone, since technological change is not necessarily import-replacing, as it was in the case of silk and natural rubber, largely under the spur of wartime shortages. For instance, displacement of steel by aluminum in certain uses might well spell increased imports; so would a trend towards alloy steels requiring greater quantities of such imported additives as nickel, chrome, and others. At present, our advanced industrial technology tends rather to bring about a growing use of commodities that we cannot, or can no longer, produce at home in sufficient quantities, except possibly at steeply rising real costs.

The previously discussed marginality of imports may have been partly responsible for reversing the downward trend of the import-income ratio. Coincidental with the dollar devaluation in 1933-34, imports of crude materials and semimanufactures began to lag progressively behind industrial production, while the domestic output of import-competing crude and semimanufactured materials increased. (See G. Lovasy and H. K. Zassenhaus, *loc. cit.*, Chart 1, page 272 and page 286.) Although other factors also entered into the picture, it

would appear that imports were proportionately more affected by the decline in total demand and their share in raw material consumption shrank. By the same token one might also expect that rising incomes would call for a more than proportional increase in imports.[9] This appears to be precisely what we have been witnessing recently. A first substantial rise of the import-income ratio has already taken place, as Table 2 shows; although fluctuations will undoubtedly occur, the projections imply that no renewed decline need be anticipated for the long run and that a further slight increase may be in store.

The Future of the Terms of Trade. The extended range of projections adds perspective to another controversial problem: trends in primary commodity prices and the terms of trade of underdeveloped countries. It will be recalled that this topic has been frequently discussed in international meetings, especially of the United Nations, in relation to problems of financing economic development. A United Nations study (*Relative Prices of Exports and Imports of Underdeveloped Countries* [1949], especially page 121) claims to show that the prices of primary commodities have declined 40 per cent relative to those of manufactured goods over a period of seventy years preceding the second World War. Another report (*Economic Survey of Latin America for 1949* [1951], page 55 and following) suggests that there is an inherent tendency for this price relationship to deteriorate with each successive recession, a theory that is certainly not substantiated by the recessions of 1949 and 1953. The statistical basis for price series going back a long way is open to considerable doubt, and a more recent United Nations report (*Commodity Trade and Economic Development* [1953], page 12) by a panel of experts is much more cautious in its inferences and warns of drawing conclusions for the future from past tendencies.

On the other hand, secular changes of the terms of trade are undeniably of great importance to primary-producing countries as a determinant, not only of their national income, but also of their ability to import consumer goods and development goods. It is therefore relevant to note that the trend which turned progressively unfavorable to primary commodities in the decade preceding the second World War has since been decisively reversed. Table 3 shows the course of import unit values as an index based on the years 1937-40, and Table 4 re-

[9] A rising share of services in national income is often mentioned as a reason for a less-than-proportional rise in imports. But the share of services in United States national income is no longer rising. On the contrary, the share of services in total personal consumption expenditure declined from 40 per cent in 1929 to 34 per cent in 1953. (See *Economic Report to the President,* January, 1954, p. 172.) We are a nation of "doers"; thus even increased leisure does not necessarily mean a smaller share of goods. The contrary may be true—witness the do-it-yourself boom with its increased sale of tools and materials.

TABLE 3

UNIT VALUE INDICES OF SELECTED UNITED STATES IMPORTS BY COMMODITY GROUPS

(Average 1937-40 = 100)

	1948	1975		
		"Low"	"Most Likely"	"High"
Crude and semimanufactured materials	207.4	267.3	300.6	321.4
Crude and semimanufactured materials, excluding petroleum	197.0	198.3	220.7	243.0
Crude and maufactured foods	353.9	434.6	486.4	538.2
Total	233.3	292.7	330.6	357.8
Total, excluding petroleum	226.9	249.6	280.0	308.8

SOURCE: Table 1.

lates this index to one of unit values of United States exports of finished manufactures. It will be seen that by 1952 the terms of trade of crude and semimanufactured materials had improved about one-third above the prewar base. The price relationship of foodstuffs had turned nearly 200 per cent more favorable, largely owing to the unusual price rise of coffee and cocoa. On the whole, the terms of trade

TABLE 4

RELATIVE PRICES OF SELECTED UNITED STATES IMPORTS AND UNITED STATES EXPORTS OF FINISHED MANUFACTURES BY COMMODITY GROUPS*

(Indices, average 1937-40 = 100)

	1948	1975		
		"Low"	"Most Likely"	"High"
Crude and semimanufactured materials	90.9	141.8	147.7	149.9
Crude and semimanufactured materials, excluding petroleum	86.3	116.4	121.3	125.8
Crude and manufactured foods	155.1	230.6	239.0	251.0
Total	102.2	155.3	162 4	166.9
Total, excluding petroleum	99.4	146.6	153.8	159.9

* Import unit value index divided by export unit value index of finished manufactures' See footnote 1 for details, especially the use of an "imputed export price index" for 1975.

SOURCE: Table 3.

of United States imports of the selected raw materials and foods had improved nearly 60 per cent above their prewar base by 1952. "Terms of trade" is here used to describe the price relationship of commodities —primary versus manufactured—rather than, as is customary, that of imports and exports of countries. They are based on the Paasche type indices of United States imports shown in Table 3.

This development restores to primary products the level of price

relationships in United States commodity trade that appears to have prevailed about forty to fifty years ago, depending on which set of statistics is used.[10] Moreover, the passing of the post-Korea commodity price boom, while affecting certain commodities materially, has not, on an average, brought about a return to prewar relationships. Most important, as Table 4 shows, the long-run outlook for the next two decades suggests that the improvement of the terms of trade over the prewar level is likely to be maintained and, possibly, even slightly increased.

As a result, one may feel encouraged to believe that the adverse trend of the depression, and possibly of earlier decades, has been reversed—not passingly but decisively. To use the word "permanently" in this connection would appear too bold, since temporary declines in line with the rhythm of world prosperity cannot be excluded. Thus instability may well remain a very real problem. Moreover, various commodities and, hence, different producer-countries must be expected to fare differently over time. However, the danger of secular deterioration of the terms of trade of primary products imported by the United States appears no longer as the inexorable threat envisaged by the interpreters of earlier data.

IV. *Implications of Increased United States Imports for the Economic Development of Primary-Producing Countries*

Greatly increased exports to the United States would appear to hold out alluring prospects to potential supplier countries. However, among the less developed primary-producing countries a suggestion that exports might be profitably increased meets often with distinct disfavor, largely based on adverse historical experience. Since the volume of exports depends on foreign demand, great fluctuations were experienced in the past, with disastrous results for economies that are dependent on export proceeds for nearly all their essential needs. In such countries, exports tend to be viewed as a symptom of imbalance, in contrast to the goal of greater diversification to which the underdeveloped areas generally aspire. Taking this widespread attitude into account, the following section analyzes the gains that greater exports seem to offer to the internal economy of primary-producing countries.

A near doubling of imports by the largest importer in world trade is bound to have profound effects on supplier countries. The impact will be greatest where the export sector provides a sizable share of the

[10] A long-term series computed by the Pan American Union puts the average price index of Latin-American exports of raw materials and foodstuffs relative to United States wholesale prices in 1953 at 105.7 (1900=100), approximately equal to the 1897 level. See "Terms of Trade of Latin America· Their Development and Prospects," September 15, 1954 (mimeographed).

national product. As a rule, therefore, the less developed primary-producing countries will be most significantly affected. However, in recent years some doubts have been cast upon the gains ultimately realized by such countries from foreign investment in export industries. (For example, H. W. Singer, "The Distribution of Gains between Investing and Borrowing Countries," AEA *Papers and Proceedings,* May, 1950, page 474 ff.) It may thus be worth while to review the opportunities that may arise for primary producers from a growth of exports to the United States as large as that implied in our projections.

In discussing the benefits of trade for the primary-producing countries, it may be well to distinguish clearly between national income aspects and balance-of-payments effects. To be sure, the availability or the lack of foreign exchange for specific imports may also, in the final analysis, affect the growth of production and hence of incomes. This latter mechanism, however, is more roundabout than the income effect of exports and of export-related investment, which will be discussed first.

Income Effects of Increased Exports. In an attempt to appraise the scope of income propagation that arises from increased exports, it may be useful to revert to fundamentals. The following brief sketch will therefore be couched in terms akin to traditional multiplier analysis, even though statistical verification could hardly be successfully undertaken. Larger production for export increases the income of an economy's export sector. Higher incomes in the export sector, in turn, tend to bring about a secondary round of income creation, followed by other cycles in the well-known multiplier sequence. Since the marginal propensity to consume is usually quite high in less developed areas, one may feel inclined to expect a multiplier effect of a high order.

In reality, however, a structural peculiarity of underdeveloped economies probably deprives the multiplier of some of its strength. The area in which this mechanism can freely operate is limited to the monetary sector of the economy; the subsistence sector tends to remain outside the main stream of income propagation. Initially, therefore, the cumulative effect of rising incomes in the export sector may not be as large as one would expect on theoretical grounds. By the same token, however, the effectiveness of the multipler mechanism is apt to grow apace with the widening of the market economy and economic development generally.

Still other impediments and leakages hamper the multiplication of income growth originating in the export sector. The narrow productive base of an underdeveloped economy makes for a low elasticity of supply, especially in the short run. Where backward methods and economic organization obstruct the growth of supply in response to greater

demand,[11] a part of the income gain may be frittered away in price rises. Inflationary pressures that result from the rise in exports and its secondary monetary effects thus would tend to reduce the size of the aggregate income gain in real terms.

If, on the other hand, excess demand is met by greater imports, this leakage will also reduce the multiplier. It seems reasonable to assume that the average and the marginal propensities to import are quite high in underdeveloped countries, especially among the high-income groups (particularly if foreign travel and a proclivity to keep balances abroad are taken into consideration). A rapid expansion of incomes would tend to add to this propensity if profits increase more than wages; in that event, a large part of the increment might be spent on luxury imports, while the lower income groups probably concentrate more on domestic staples. To the extent that the distribution of income would thus affect the propensity to import, it matters considerably whether an increase of export values is due to a change in volume or in price. As a rule, a greater export volume brings about an increase in wages and profits, while higher prices raise profits only, at least in the short run. Hence, since profit earners in the less developed countries tend to import more and also to save more, one feels encouraged to speculate that an increase of export prices makes for a smaller multiplier than a growth of export volumes. On the other hand, such savings from higher prices and profits offer greater opportunities for income growth in the long run, depending on the upper income groups' propensity to invest.

Income Effects of Export-related Investment. Since our projections point to a substantial and sustained rise in American imports of numerous commodities, it stands to reason that sizable investments in the producing countries will be required to achieve the requisite growth of output in the foreign producing areas. A large share of the capital will undoubtedly have to be contributed by the industrial countries to whom a large part of the increased output would eventually be shipped. On the other hand, it is believed that the producing countries derive little benefit from such investment because the multiplier effects "took place not where the investment was physically or geographically located but (to the extent that the results of these investments returned directly home) they took place where the investment came from." (H. W. Singer, *loc. cit.*, page 475.)

There is considerable value in this much neglected approach. Nonetheless, it may be useful to probe somewhat deeper. Undoubtedly the multiplier effect of foreign investment is greatly reduced by virtue of the fact that most, if not all, of the equipment is of foreign origin. Thus

[11] See V. K. R. V. Rao, "Investment, Income, and the Multiplier in an Underdeveloped Economy," *Indian Economic Review*, February, 1952, pp. 58 ff.

the import leakage tends to be large; in fact, it may be conceptually permissible to eliminate such "investment in kind" from the investment total and ponder only the income effects of local expenditure. This includes, in all instances, construction and sundry labor and frequently also tools, accessories, working inventories, etc. Moreover, such investments often require collateral investment in transportation, power, and other fields. Experience shows that this local investment component is quite large—no matter whether it is financed from abroad or domestically.

In such a perspective, there is no reason to doubt that this kind of investment is apt to have cumulative effects on income that resemble those of the purely domestic type, provided such investments keep recurring on an increasing scale—as they well might have to in order to produce growing outputs. Moreover, this effect is additional to the previously discussed income-creating effects of increasing export increments.

A related argument appears to refer to the type and localization of investment. It is said that investments in export industries contribute less than other types to knowledge, external economies, and the integration of the economy. (See H. W. Singer, *loc. cit.*, page 475, and comments by Ragnar Nurkse, *Problems of Capital Formation in Underdeveloped Countries* [1953], page 84 ff.) Varying conditions probably tend to make this statement less valid in certain instances than in others. In any event, it does not appear practical to discuss specific investment propositions in terms of alternatives. As a rule, the host country has only the choice of refusing raw material investments or of making the most of the opportunity by demanding a fair share of the proceeds for its own developmental purposes.

Finally, the suggestion that the remittance of investment incomes is an undesirable drain on the host country's capital resources deserves attention. In the event of investments made in order to increase exports to the United States, the foreign exchange aspect can safely be ignored. From any other angle, the important factor for the economic growth of the producing country is not the amount of profits transferred but the amount retained and reinvested. As long as the demand for the product increases—and our projections point in this direction—expansion will be necessary and is apt to be financed from retained earnings. Recent statistics of the Department of Commerce indicate that, lately, the percentage of earnings reinvested by United States companies operating abroad have been quite high, probably upwards of 50 per cent (*Survey of Current Business*, December, 1953, page 10). To be sure, the part of profits that is withdrawn does not directly contribute to the host country's welfare. On the other hand, this is no more

than the price paid for securing the income-raising benefits that actually accrue to the economy from three sources: the original investment, reinvestment of earnings, and increased exports. Although their combined multiplier effect may not be as large as one might expect on abstract grounds, it is likely to be substantially in excess of unity.

Foreign Exchange Aspects. As a country's population and its income grow—owing to increased production for domestic use or for export—more imports are required to match growing needs. Increased domestic production may gradually reduce import requirements of consumer goods, but more capital goods and raw and intermediate materials are needed to promote further development. Therefore, the capacity to import of developing countries has lately received a great deal of attention.

In view of such growing exchange needs, it seems unfortunate that developing countries frequently do not look with favor at increased trade in raw materials as a source of additional foreign exchange receipts. The historic reasons are, of course, well known. They can be summed up under two headings: the danger of overspecialization and the burdens of overdependence. On the other hand, what are the more desirable alternatives to greater exports? Greater foreign investment—even less welcome than trade from the angle of overdependence—cannot be relied upon to increase at a sufficiently steady rate to match the needs. Foreign aid on the requisite scale is even less dependable and much less acceptable to self-reliant nations as a permanent feature. This lack of choice makes it desirable to investigate whether our projections imply a measure of relief from the alleged dangers of increased reliance on exports.

Our projections suggest a fundamental reversal of previously unfavorable trends that had made export specialization appear so perilous. While the possibility of future fluctuations cannot be excluded, their degree and duration will be subject to more effective control by deliberate antideflationary policies in the industrial countries. Moreover, downswings tend to be more moderate in periods of long-term growth, such as those to which all projections point—provided proper policies are adhered to. Furthermore, the prospective shift in the American propensity to import promises to give the full benefit of our rate of growth to our suppliers as a group, though not necessarily to every country. Even more rapid increases of demand are expected elsewhere.(The expected increase of manufactured goods imports by the United States would indirectly increase the exports of raw materials to this country's suppliers.) Finally, as stated before, the terms of trade, too, have already shifted significantly in favor of primary-pro-

ducing countries. On the average, no long-term worsening appears to be in store and further improvement is quite possible.

Producers of products facing favorable demand prospects in this country and elsewhere can thus look forward with greater confidence than ever before to a sustained growth of their export proceeds, provided they can keep in line with cost and productivity trends in their industry. Given such conditions, it is hard to see why they should continue to shrink from promoting the growth of their exports, save for a somewhat amorphous fear of an "overdependence" that is sometimes characterized as "economic colonialism."

Two elements appear to stand out to justify such fears. First, the relative size of the export sector is seen as a structural defect which places the country at the mercy of factors beyond its control. To increase exports would seem to increase the imbalance and make the country still more dependent. Second, the additional foreign investment required to bring about the growth of export facilities seems to enhance the foreign element in countries that strive for greater self-reliance, both financial and hence—as they see it—also political. As a subsidiary consideration, the argument is heard that the export industries drain resources of manpower and skills—perhaps also of capital—that could be used to greater advantage in development projects of a more general nature.

The force of these arguments diminishes if we look beyond the first stage of the growth process. To be sure, both the ratio of exports to total product and of foreign to domestic investment may initially increase when the export sector is expanded. However, as exports grow, the producing country can secure the wherewithal to expand the other sectors of the economy. Deliberate policy in this direction may be needed and has already become commonplace, as the governments of producing countries have proved themselves increasingly adept in exacting a large share of profits and foreign exchange proceeds from exports. If these are used for economic development, the export sector tends to shrink in relative importance, even though it grows in absolute terms. The share of foreign investment also declines as domestic activities increase. (For example, with regard to Mexico see International Bank for Reconstruction and Development, *The Economic Development of Mexico* [1953], page 16 and Table 12, page 183.)

Investment in export industries and in other developmental activities thus need not be considered mutually exclusive alternatives. Each has its function to perform. A growth of export industries is uniquely suited to provide income and foreign exchange with which a progressive diversification of the economy can be financed. In this manner, exports

gradually help reduce the overdependence that they seem to increase in the early stages of development.

The Gains from Trade. Given appropriate policies, the gains from increased exports no longer appear negligible in the light of the preceding analysis. One can occasionally observe a tendency to dismiss these benefits because the prospective average growth of exports appears to be limited to an order of magnitude of 2-3 per cent per annum, or no more than the population increase. It may be useful to evaluate this growth from the point of view of income and of foreign exchange.

Offhand, one fails to see why exports alone should be expected to take care of population growth, and from that angle a reference to population appears irrelevant. On the contrary, one might well wish total incomes to grow faster than exports so that the relative importance of the export sector would gradually decline. What matters for our purpose, however, are two considerations that emerge from the preceding discussion. In the first place, a given increase of exports tends to bring about a proportionately larger increase of incomes. While it may not be advisable to assign specific numerical magnitudes to the three types of multiplier previously referred to, it stands to reason that they are greater than unity, and probably quite substantially so.

Moreover, these increments of income are of great marginal importance. Where exports provide an important share of total incomes and where in the early stages of development such incomes leave little scope for capital formation, the marginal increase supplied by greater exports might over the years make a decisive difference for the future rate of capital formation and development.

Finally, we might be committing a grave omission in viewing the relevance of greater exports only in aggregative terms. From the angle of foreign exchange supplies, the capacity to import specific goods—or the inability to do so—can be much greater than value figures suggest. The history of exchange shortages is replete with instances of desperate attempts to remove bottlenecks by "robbing Peter to pay Paul."

Leaving aside the consequences of improvidence and injudicious policies, the importation of capital goods for development in particular may directly depend upon growing foreign exchange receipts over and above expenditures for essentials. The specificity of capital goods is such that the cumulative output that depends directly and indirectly on the availability of certain equipment is many times its value. In this respect, it may be permissible to suggest the existence of an "equipment multiplier" which expresses the marginal efficiency of foreign exchange increments in terms of productivity of the capital goods they could buy. Although measurement could hardly be attempted, this concept helps

to illustrate the marginal importance of additions to foreign exchange supplies resulting from exports.

To be sure, the benefits individual countries can derive from their exports depend to a large extent on the composition of their foreign trade, their economic structure at home, and their economic policies. In addition, however, traditional mistrust of export activities as an instrument for economic growth often discourages the very development that foreign trade could serve. In the light of the present discussion, one might hope for a more judicious appraisal of the opportunities that a growing export potential can provide under favorable conditions.

DISCUSSION

C. P. KINDLEBERGER: The two papers before us could not be more different. Baldwin is skeptical both of the meaningfulness of the net barter terms of trade and of the possibility of their measurement. He is even dubious that we know what happened to them in 1875. Aubrey on the other hand is prepared to use estimates of population and GNP in 1975 to arrive at forecasts of the volume, price and value of imports, and the price of exports, taking the forecast of the terms of trade fifteen years further into the future than the previous terminal date of 1960.

While my assigned responsibility is to comment on the paper of Baldwin, whom I shall chide for timidity, I cannot refrain from remarking on Aubrey's courage, or should I say audacity. I understand how he arrives at a range for the volume, price, and value of imports—through consulting experts in particular commodity fields, whose biases, if any, are presumably distributed in random fashion and not systematically affected, as were possibly those of the Paley Commission experts in 1951 by short-term commodity shortages brought on by the Korean war. Even here I have difficulty in suppressing doubts as to the ability of these experts to predict the prices of say coffee and cocoa in 1975, the year when I retire, when market forces have had such difficulty in finding stable levels for these goods in the last six months. But the predicted price level of United States manufactures would seem to have an even more tenuous foundation, and with it, the predicted terms of trade. I must leave to my colleagues the task of commenting on Aubrey's views on what these terms of trade imply for primary-producing countries—views which appear to be based on a favorable opinion of income-creation in the process of economic development where I should have thought that no stimulus to employment as such was desirable—and return to the first paper.

Baldwin is of course correct in adopting a skeptical attitude on the meaning to be attached to the terms of trade and to the validity of the statistical record of experience. But does he not go too far? In the case he mentions of trade taking place between two countries where the opportunity-cost ratios between two commodities were identical before trade, I assume that he has in mind trade based on differences in taste. Here the Mill formula based on identical tastes and different production-possibilities curves will not operate, but relatively little change is required to adjust it: the country experiencing the greater change in relative prices before and after trade may be said to receive the greater gain from trade.

When he discusses the welfare implications of terms-of-trade changes, he stacks the deck, in my view, when he claims that it is possible for one country, in a two-country-two-commodity model, with identical tastes and proportionate increases in productivity in both commodities, to experience an unfavorable shift in the terms of trade but receive a greater gain in utility, measured cardinally, than the other. To reach this result, it is necessary to assume that

one country is rich, the other poor, and that the two goods have very different income elasticities. The greater gain in utility for the poorer country experiencing an unfavorable shift in its terms of trade then means only that the utility of material gain for the rich country is smaller than that for the poor. The rich country gets most of the material benefits of the increases in productivity, but since it is sated, it can experience only a small gain in utility. Taussig's point that the change in terms of trade produced by a shift in demand has ambiguity from the point of welfare is of course valid, though I fail to see its relevance to this case with unchanged identical tastes. The gimmick here is that identical tastes are hardly meaningful for countries of widely disparate real incomes consuming at a great distance from one another on the shared indifference map. This is like the equality of the law described by Anatole France which permits rich and poor alike to sleep under bridges on cold nights.

I agree further with Baldwin that it is necessary to make one's welfare assumptions explicit in a discussion of the terms of trade, and that it is useful to discuss much more than the ratio of export to import prices, including from time to time the volume of exports and imports, changes in productivity which may have supervened in old commodities, the effect of introducing new commodities, etc. But while he tells us that it is possible for the terms of trade to move in ways which are meaningless or at least ambiguous for welfare, has he undermined what the underdeveloped countries would want to claim: the existence of a presumption in favor of the proposition that a country is better off as to its balance of payments, its real income, and its welfare, with more rather than less favorable terms of trade. If other things are equal, this is so. And what Singer has claimed, it may be appropriate to recall, is that things are more generally equal in the case of underdeveloped countries than for others because of inflexibility of resource allocation, a slow pace of technological change, etc.

Baldwin's skepticism on the subject of statistics further seems to me excessive. His separate points—the weakness of unit-values, index-number, and sampling difficulties, the bias of qualitative improvement in commodities and the necessity to take into account services as well as merchandise—can all be accepted. Still further qualifications could be added, such as the desirability of correction for the import content of exports, and the unrepresentativeness of single years such as 1938, in a period of cyclical depression, to which many trend measurements run. One can also be skeptical whether the terms of trade improved or declined over given periods of years, although I would think that there was no doubt but that the British terms of trade improved from 1881 (not 1870) to 1913 since the series of Imlah, Schlote, Silverman, and Debenham show a rise of roughly 20 to 25 per cent after an (almost?) equal and much more precipitous decline from 1873 to 1881. The example of statistical ambiguity I prefer relates to the period from the turn of the century to 1913, when the capital outflow from Britain reached its prewar climax. Here year-to-year changes are considerable and, within limits, fairly erratic. Accordingly, one can pick any sort of trend one wants between 1896, 1900, or 1902, on the one hand, and 1910 or 1913, on the other, to claim that

the terms of trade improved, declined, or moved sideways. Certainly no existing statistical measurement of British terms of trade in this period seems sufficiently clear cut to permit economists to generalize about the short-run effects of capital exports on the terms of trade, as many of us have.

One can easily pick disquieting examples of index-number and sampling difficulties especially when the structure of trade is changing drastically. The Staehle example on Belgium-Luxemburg is not very damaging to the cause of index numbers in my judgment since it relates to a year when structural change was under way and covers a seasonal movement which inevitably will produce a spread between the Laspeyres and the Paasche calculations. Statistical crudity makes one wary of attaching meaning to movements of 10 to 15 per cent. There is still likely to be significance to wide movements. Between 1913 and 1952, the net barter terms of trade of Western Europe, according to some measurements I have made, declined 20 per cent vis-á-vis the United States and improved 50 per cent vis-à-vis underdeveloped areas of the world outside of Europe. If the double factoral terms of trade could be measured, I suspect that the spread would have been even wider.

While therefore I agree with Baldwin that their thesis about the terms of trade has been inadequately demonstrated, I am inclined to believe that Singer and Prebisch have given us a penetrating, intuitive insight into the development of the terms of trade in the course of economic growth. Underdeveloped countries tend to produce commodities in which entry is easy and exit difficult. This limits their power to raise prices in periods of firm long-run demand—certainly after a gestation period needed to expand capacity which may be long in such cases as coffee—and to maintain them in depression. Colin Clark, W. Arthur Lewis, and perhaps Aubrey would argue that limits on natural resources are going to change this position with respect to entry as depletion in the United States proceeds and populations grow. They may be right, although the substitution of capital for land in developed economies, whether on the farm or in factories for synthetics, provides a counterbalance of which inadequate notice has perhaps been taken.

As against the underdeveloped country, the more advanced country, provided it is not senescent, can readjust its resources to price changes, so that in the limiting case with Paasche indexes, its terms of trade are always 100. When import prices rise, resources shift into import-competing lines; when increases in demand threaten a rise in export prices, expansion of export volume heads it off. If the supply of export and import-competing goods is more elastic with respect to price changes in developed than in underdeveloped countries and a fortiori if the supply of export and import-competing goods is inelastic for price increases and elastic for decreases in developed countries, elastic for price increases and inelastic for decreases in underdeveloped countries, there may be something to the Singer-Prebisch thesis. But in this circumstance the appropriate therapy is not price stabilization through buffer-stock and similar devices on the demand side so much as increased capacity to adapt supply.

THEODORE MORGAN: The central significance of these two papers seems

to me to be that they each throw light, in two different ways, on a major policy problem: the disposition of underdeveloped countries to identify economic development with industrialization and diversification and to lay their bets for development primarily on manufacturing industries. The very considerable labors of both Aubrey and Baldwin have a healthy effect. They help set up warning signals against the usual acceptance of the British 1876-1948 terms-of-trade data as significant, valid for the world as a whole, and indicative of future trends.

To the extent an underdeveloped country is persuaded by Aubrey's research that primary products will have firm and probably rising prices, it is encouraged to specialize in their production. To the extent it trusts Baldwin's analysis, it would feel that both the significance and accuracy of terms-of-trade data of the past are questionable.

The basic procedure used in the Aubrey study is to resort to commodity experts for guidance. Imports are the difference between domestic capacity production, allowing for technical advance, and domestic consumption, as estimated. Prices are a "partly intuitive but [to the experts] quite tangible, appraisal of long-run cost trends in their industries." Population is projected, as basis for demand for food, despite lamentable experience in population forecasts.

Certainly these estimates are extremely fragile. The experts are asked to estimate imports as a residual, in the darkness of twenty years ahead, allowing for the unpredictable gifts of technology!

But it is not fair to Mr. Aubrey to emphasize overmuch the extreme precariousness of long-range predicting. The fact is that no method is much good. At the same time, estimates are in perennial demand. The aim is to do the best one can.

By this modest standard, Aubrey's method looks worth trying. One can allow for experts' tending to be conservative in their projections ("better to fail conventionally than to succeed unconventionally") and for their probably being overinfluenced by the experience and trends of their recent past, and still come out with the feeling that predictions of the future that diverge drastically from this consensus-of-experts view at least need strong support.

What about the income effects of increased exports from underdeveloped areas? The discussion implies—or I misread it—that rising money incomes are an advantage. But they are mixed: partly a problem, partly an opportunity. There may result some modest rise in domestic production, which is desirable. There will tend to be rising domestic prices, beyond a moderate level undesirable. There will tend to be a sharp rise in imports of consumer goods. The government's problem is to capture a large share of the windfall increase in incomes and divert it to long-run investment. The early discussion here omits government and so omits the crucial government problem of devising a tax program to minimize the problem and maximize the opportunity.

With respect to Baldwin's paper, the case, I think, is not proved on the major issue of what terms of trade are least objectionable toward indicating the effect of foreign trade on real income. Of his three indexes, he concludes "the commodity terms of trade appear to be among the most objectionable."

But the only criticisms are that an increase in the productivity of resources used for exports can more than offset a deterioration in the terms of trade and that long-run benefits can sometimes more than compensate for short-run injury. These are reasonable qualifications. If they are not taken into account, that seems the fault of the user, not of the index.

The comparative advantage of the commodity terms-of-trade index receives further evidence from the neat illustration that Baldwin gives of how the income terms-of-trade index (total value of exports divided by an index of import prices) can easily go astray.

The third index is the single factoral terms of trade: the commodity terms of trade multiplied by an index of the productivity of the factors of production. This is statistically unusable save for the single factor, labor, which is at best only one of several factors.

Nor is the solution of using a lot of data—"export and import volume indices, productivity changes in the export and internal sectors, and a host of other economic indicators"—generally useful. Nearly all underdeveloped countries, and many developed ones, just do not have a lot of reliable data. And ordinarily the time and funds of the investigator are limited, and he is forced to look to one or several of the most significant kinds of reliable data available.

I am forced to the view that Baldwin's analysis leaves his reject single measure, the commodity (or perhaps commodity plus services) terms of trade, still in first place.

Next, to the data. Some problems of construction of terms of trade simply blur the result. The general weighting problem is an example. But the biases usually found tend consistently to understate the price position of the primary producer. The new products and quality change bias mentioned by Baldwin both tend to understate the relative price position of primary producers, since improvements have taken place predominantly in manufactures. Again, the British data, measuring value of exports and imports at port of entry or exit, have a built-in distortion that further understates the relative price position of primary producers—for as Baldwin illustrates, transport costs have been falling in the past century. More and primary-producing countries have been paying a price for British goods higher than British export prices by a falling margin; and primary producers have been getting paid a rising proportion of the prices of their products valued at British port of entry.

And further still, the Schlote data for Britain, 1801-76, show a very wide improvement in the relative prices of primary products—so wide as to leave no room for doubt as to the trend.

These indications of weakness in the British data quoted from the League of Nations and UN studies have led me to investigate customs and domestic data on the relative prices of primary goods versus manufactures in six other countries for which data appeared reliable enough to use. The countries were the United States, India, Japan, New Zealand, the Union of South Africa, and Brazil. Data from two countries went back to the beginning of the nineteenth century, three to the 1860's or 1870's, and two to 1901 and 1910.

The results show much variety of experience. Two countries show clear rises

in the terms of trade of primary producers (the rise in the United States is remarkable—some 400 per cent since the beginning of the nineteenth century, on the basis of excellent data); four show various changes or ambiguity. With these results can be compared a recent (September 15, 1954) Pan American Union study of the terms of trade of all Latin America. The recent level is found to be about the same as at the beginning of the century.

I conclude the British data are misleading. There has not been any general worsening of the price position of primary producers.

Should we expect such a worsening? Prebisch said yes on the ground that "lack of organization among the workers employed in primary production prevents them from obtaining wage increases (in the boom) comparable to those of the industrial countries and from maintaining the increases to the same extent (in depression)." (*Economic Development of Latin America,* page 13.) Singer said yes since "technical progress in manufacturing industries showed a rise in incomes while technical progress in the production of food and raw materials in underdeveloped countries showed a fall in prices." (AEA *Papers and Proceedings,* May, 1950, page 478.) Kindleberger said yes in his *Dollar Scarcity* (page 122): "The certainty of loss arises for agricultural and primary product countries from the assumption of continuously increasing efficiency of production in these and in manufactured products, and . . . the application in these circumstances of Engel's law." Today Kindleberger is inclined to say yes because of assumed supply elasticities in developed and underdeveloped countries.

Here are four lines of explanation for a fact that is at best questionable. What if the terms of trade of primary products have not been worsening? The general doubt associated with these arguments seems to me to be that they look to matters associated with and derivative from the trend of prices of primary and manufactured commodities rather than to the basic determinants of those prices; that is, the long-run trends of world supply and demand. I suggest that on these basic determinants it is possible to say something, despite scarce data.

ARNOLD C. HARBERGER: Let me announce at the outset my admiration for Mr. Aubrey's bold spirit. Though one may quarrel with the details of his paper and his approach, one cannot help but sense that he is grappling with real and important problems and doing so with great imagination and competence. More cautious minds would shrink from the task which Mr. Aubrey has set himself, but I do not hesitate to assert that our knowledge would advance much more slowly if caution became our byword and the sureness of our conclusions our major goal.

It should be clear, then, that I do not want to carp at small details in Aubrey's analysis. I rather want to point out two major crossroads at which he may have taken the wrong turn. The first concerns his use of a commodity-by-commodity approach in assessing the probable future course of the primary-finished terms of trade. The second concerns his emphasis on the possible multiplier effects of investment in underdeveloped countries.

One cannot be long immersed in the data on long-term growth and develop-

ment before realizing the tremendous role played by technological advance. The great surges of development which our country and others have enjoyed cannot be explained on the basis of the observed increases in the working force and the stock of capital. Half or more than half of our secular growth in output seems to stem from other causes, which I tend to lump rather indiscriminately under the heading of technology. Unfortunately, we know precious little about the forces which govern the rate of technological advance. We rest, in making long-term projections, on the average pace of such advance in the last half century or so, and we treat this rate of advance as a sort of statistical regularity. While regretting its necessity, I do not object to the use of so crude a procedure in taking our sights on the future. However, I do feel that we must keep firmly in mind two facts that can easily be gleaned from existing data: our technological advance has not been at an even pace, but has come rather in fits and starts; even over long periods, there have been wide divergences in the average rates of technological advance enjoyed by different industries. These facts suggest that our crude assumptions are at their best when we deal with rather long periods of time (to average out periods of spurt and sluggishness) and with rather broad commodity groups (to average out individually divergent rates of progress).

One may here ask whether Aubrey is not on safe ground in making independent projections of the relative prices of a series of primary commodities, and then averaging out the results to get an index for the group. Here, I think, we must inquire more closely into the precise method he used. Demand projections, obtained by familiar and relatively widely accepted methods, were juxtaposed to supply projections based in a consensus of expert opinion. Price projections were deduced, again with the aid of expert consensus, from the size of the anticipated gap between supply and demand at recent prices and from the anticipated responsiveness of both supply and demand to price changes. Now I have the utmost respect for the judgments of commodity experts in the daily decisions they have to make. Yet I wonder whether these experts could have been sufficiently indoctrinated in the subtleties of secular growth to give predictions that are reliable for the long run. If we think in terms of a constant price level, we can envision labor costing roughly double its present wage a quarter century hence. In some commodities, technological advance will have operated to make labor three or four times as productive, so those commodities will decline in price. Other goods will have been more or less bypassed by the surge of technology and they will suffer price rises. It seems to me that few experts could be expected to give reliable judgments as to the likelihood and impact of major innovations over the next twenty-five years. Yet do not their price projections imply just such judgments? My feeling here is that these implications were seen only vaguely, if at all, by most of the experts, and that their projections ignore to a great extent the crucial technological elements in economic progress.

All this might be of minor importance if Aubrey's general conclusion were supported by an analysis of the primary-finished terms of trade on a more aggregative level. But it is not at all clear that this is so. I shall confine myself here to presenting a plausible picture of the world a generation from now, in which, contrary to Aubrey's expectation, the terms of trade have

moved against primary products. I make no pretense of its being more than a rough sketch, and I emphasize that I do not rule out the possibility of an equally plausible case being made on the other side. I only hope to preserve the future of the terms of trade as an open question for further speculation and analysis.

Assume for a moment that the population of the world remains stable and that, due to technological advance and related forces, output per head doubles in a generation or so. Let this doubling of productivity occur in both the developed countries and the presently underdeveloped ones and in both primary and finished goods production. It is well established that the income elasticity of demand for primary products is well below unity, and I think we can safely assume it to be somewhere around .5. Under the assumed conditions, market forces a generation hence would call for a net movement of one-fourth of the resources presently in primary production out of the primary and into the finished goods sector. This is a movement of substantial magnitude, and it probably would be impeded by the usual barriers to mobility. Yet if the movement were not accomplished, primary product prices would fall relative to finished goods prices; indeed, such a fall would appear to be the market's way of calling forth the needed movement.

Now let us relax the assumption of stable populations and assume that the population of primary-producing areas increases more rapidly than that in the rest of the world. This, clearly, would only accentuate the downward pressure on primary product prices. To reach Aubrey's conclusion we must assume either a rather strong bias in technological advance against primary products or a rise of limitational factors (ore reserves, land, etc.) to a place of almost unprecedented importance.

My second point has to do with Aubrey's use of a multiplier-type analysis to assess the effects of increased exports and export-related investment in underdeveloped economies. Multiplier analysis is at best with problems of cyclical unemployment. Here, owing to a number of rigidities in the price mechanism, it is usually reasonable to view increments in output as if they had no cost in terms of foregone alternatives. Secular analysis typically—and I think properly—assumes resources to be fully utilized. A rise in the price of exports then enhances the real income of the exporting country just as a rise in a person's wage enhances his real income. An increment of capital adds to the output of a country its marginal productivity. One needs, I think, more justification than Aubrey offers before one abandons this traditional picture. One can go a part of the distance by assuming that disguised unemployment is rife in the less developed countries, with labor in particular having effectively zero marginal product in many areas. But I feel that disguised unemployment of this type is the special rather than the general case. Almost by definition, it cannot exist in a market economy, and to the extent it has survived in a nonmarket sector, resisting the blandishments of a going wage in the market economy, special explanations, varying from place to place, will probably be required. In particular, there is no reason to expect that such disguised unemployment, rooted in custom and tradition, would be dissipated through the workings of a Keynesian multiplier or an export or investment base.

ECONOMIC RESEARCH AND PUBLIC POLICY

By J. A. LIVINGSTON
Philadelphia Bulletin

To prepare this paper, I sent out a questionnaire to seventy-six economists and statisticians and received replies from twenty-five. Among the respondents was Robert R. Nathan, who started off by saying: "You are a lazy bum making others work for you. However, you have done that successfully in the past and I don't blame you for continuing."

Another of my unpaid advisers was J. Frederic Dewhurst, who declared: "You deserve the title of Mr. Questionnaire, not only because of the headache you send out every six months, but because of your circular letter. Are you trying to get everybody else to write this paper for you?"

Both Nathan and Dewhurst referred to my custom of collecting semiannual forecasts from fifty to sixty economists. The result of those questionnaires led me to the conclusion two years ago that economic forecasters are wrong about two times out of three. Since then, I have revised my faith upward. The economists have been remarkably accurate in anticipating the 1953-54 recession and recovery. The record has so improved that I can now say that economists are right about half of the time. Since business can move up, down, or sidewise, this is reasonably good. There are two chances out of three to be wrong. Hence, a fifty-fifty record is better than chance.

This forecasting record is cited because of its relevance to our subject. In a society in which the government assumes responsibility for economic stability and high employment, forecasting becomes a part of the public domain. National policy cannot be made without some assumptions about the future. And the hazards of forecasting will be reduced if the government achieves economic stability. The less erratic is the business cycle, the less eratic will be forecasting. That will set off a nice chicken-and-egg argument: Did accurate forecasting produce economic stability or economic stability accurate forecasting? And it is desirable for the government to adopt measures which lessen dependence on forecasting. Of this, more later.

We are in a new era. It began with the Employment Act of 1946, which established a Council of Economic Advisers to assist and guide the President in formulating his economic program. It established in

the Congress a Joint Committee on the Economic Report, which studies proposals of the President, and then suggests implementary[1] legislation. As the result of the law and the Great Depression of the thirties which foreran the law, the American people expect the government to prevent depressions—to protect them against protracted economic disuse and disability.

Forecasting is unavoidable because administrative wheels grind slowly. It takes three to six months to wind a tax bill through Congress. It takes as many months to put through appropriations. Changes in defense schedules likewise are authorized by the various committees slowly. And, if Congress closes its doors in July or August and the economy needs legislative treatment in October or November, it is just too bad.

Only an emergency would induce a President to call a special session. That is politically possible if business is in a tailspin, if unemployment is developing rapidly, bankruptcies rising, and the stock market falling. The needs of the times would communicate to the President and Congress what had to be done. It is much less likely that the President would call a special session to combat inflation—if higher taxes were needed, say, to check a roaring excursion into overfull employment and a price boom which might ultimately degenerate into a business bust.[2]

Therefore, the President and his advisers and the Joint Committee on the Economic Report must formulate judgments on what is likely to happen long in advance—as much as a year—so as to be prepared for countercyclical action. This country was fortunate in the 1953-54 recession. Some tax reductions became law, in line with President Eisenhower's recommendations and others in spite of his initial resistance. These imparted an uptow to consumer income and business profits which helped to moderate the decline.

I directed the questionnaire to economists accustomed to forecasting. They are familiar with its hazards, frustrations, and necessity. They have been willing over the years to subject their judgment to the harsh caprice of actual event. I wanted to find out from them what, if

[1] The Committee itself does not initiate legislation. But members of the Committee are on various legislative committees of Congress and so are in a position to influence fiscal, monetary, farm, and other legislation.

[2] I realize that in the summer of 1948, President Truman, after his nomination for President, called a special session of the 80th Congress for legislation on selective price, materials, rationing controls, stronger rent controls, and an excess profits tax. Congress went through perfunctory motions of heeding the President's requests. No legislation resulted. Mr. Truman's action was regarded as a political maneuver to put the Republican Congress on the spot. Inflation is never entirely displeasing. It was not displeasing in 1948. Furthermore, there were signs—notably falling farm prices and leveling off in the consumers' price index—that inflation was not as great a worry as the President said it was. In fact, Christmas business sloughed off and a recession developed in 1949.

any, additional information would make forecasting more scientific—would make them feel more confident of their predictions. I wanted a generalized judgment of the nation's statistical and research needs.

To be sure, the Subcommittee on Economic Statistics of the Joint Committee on the Economic Report conducted hearings on this subject in July. Well-known economists from government, business, universities, and research organizations appeared. They mentioned the missing weapons in our statistical armory. They commented on the need for greater detail in some series and for greater speed in others. They discussed the pros and cons of speed versus accuracy.

But at no point did economists and statisticians, as a group, submit an order of priority. What data are they most anxious to have? It was this gap I hoped my questionnaire would fill. It has done that only partially.

The answers indicate the concerns of the moment. When the next slump comes, if it comes, we shall be able to determine whether economists have been concerned about the wrong things. "The future is only the past again, entered through another gate," said Paula, in the closing line of Sir Arthur Wing Pinero's *The Second Mrs. Tanqueray*. In economics, however, the past offers so many gates that it is all too easy to enter the wrong one.

There was unanimous accord among the respondents—implied or specific—that the government has the responsibility to provide regular censuses of population, manufactures, business, and agriculture. These are absolute musts—benchmarks for our understanding of the world we live in. Schedules should be regular, uninterrupted by budgetary ups and downs. This reconfirms the recent findings of the Intensive Review Committee appointed by the Secretary of Commerce to evaluate the work of the Bureau of the Census.

Beyond that, the comments indicated that economists and statisticians expect the government to continue its collection of basic statistics, such as employment and unemployment, consumers' prices, wholesale prices, housing starts, banking data, new orders, sales and inventories, consumer expectations, and so on. There was not a single suggestion for curtailment. But there were several suggestions that in forecasting—in analyzing probabilities in business—statistics as statistics can be overemphasized. "We don't need more data," said one respondent, "we need better judgment."

My first question was: "What are the most important gaps in our statistical information which prevent or hinder the federal government in making effective policy decisions to maintain economic stability? (Your answer might well cover data which are seriously lacking or seriously deficient in quality.)"

Forty different types of statistics were mentioned. One economist expressed a desire for more information on industrial accidents; another for more frequent data on the gross national product in constant dollars; another for information on the costs of doing business; another for additional seasonally adjusted data on federal receipts and expenditures; two for information on the number of unemployed persons not receiving unemployment benefits; another for better information on farm expenditures; another recommended the accumulation of regional information.

Two demands stood out. Ten economists asked for better information on construction. Among the specific points covered were: more information on the supply and demand for new homes; more complete information on vacancies and conversion and demolition of old dwelling units; general improvement of all data.

One respondent said: "Additional data on real estate market developments might be of strategic importance in the next few years." Another economist was less oracular. He said: "The great construction boom of the twenties aggravated the collapse of the thirties. What about the soundness of the present building boom? Judged by the needs of the entire business cycle—not just the boom phase—are we overbuilding temporarily? And, if so, is not the government with its credit policy more responsible than anyone else? These are matters we know too little about."

Seven requested more detailed data on new orders, sales, and inventories. Oliver P. Wheeler, of the Federal Reserve Bank of San Francisco, commented: "The key role which inventories play in most short business cycles and often in major cycles, seems to call for more 'disaggregation' in the study of the inventory cycle."

There were requests for more data on consumer spending, savings, and intentions to spend or save. There were, also, requests for information on businessmen's expectations. Three economists asked for improvement in the BLS indexes of productivity.

The second question was: "What do you think the government's role should be in economic research? Should it engage solely in gathering of statistics on current developments or should it engage in long-term research projects on the effects of government policy on the economy? (This last type of research has usually been done by private organizations, such as the Twentieth Century Fund, National Bureau of Economic Research, etc.)"

Fourteen of the respondents felt that the government should engage in long-term research. Usually, the feeling was positive and enthusiastic. Six objected. The principal objection was that the government would not be impartial, that the research would be politically moti-

vated. Five did not answer the question.

The third question was: "What economic policies followed by the government in the past year do you consider most open to criticism? Would better statistical data or research have pointed out beforehand the shortcomings of these policies?"

The economists seemed to divide into two groups. Those who might be described as of the New Deal-Fair Deal school felt that the tightening of money rates was a mistake. They felt that the government should have taken more positive steps when defense expenditures were tapered downward. The increase in unemployment would not then have occurred and should not have been countenanced. Economists associated with labor unions or with labor ties were emphatic in this latter view. They expressed the feeling that the government has the responsibility of maintaining an ever expanding economy. There is no need for layoffs, letdowns, and unnegotiated shorter work weeks.

On the other hand, economists associated with banks or business firms felt that the present administration had done all right. This group is not nearly so united in its thinking as the New Deal-Fair Deal group. It is opposed to the policy of keeping the economy in perpetual high gear, ever expanding. Constant government ministration to maintain expansion would only lead to inflationary boom and then to a bust. One respondent said: "What this country needs is more frequent and milder recessions." Some in this group questioned the easy-money policy. One said that after tightening credit the administration loosened up too soon. Yet there was even some criticism of the hard-money policy in early 1953, which indicated the lack of agreement.

The fourth question was: "What economic policies would you recommend at this time? (In your answer, please indicate any important assumptions you are making about the economic climate during 1955.) Do you think that additional data or information now available would give you firmer convictions about the policies to be pursued? If so, what information would you need?"

The eighteen answers to this question produced a standoff. Nine respondents felt that the government ought to give the economy an upward push—by spending on roads, public works, defense, or by reducing taxes. Nine others felt that the present administration's policies were fine, that no great federal exertions are required, that an upturn is at hand. Immediate and large injections of government spending are unnecessary.

One respondent said the principal problem was to guard against overspeculation; another said the principal objective should be to stop inflation. Here, the inference is that the easy-money policy is leading to excessive expansion of home building and construction of all kinds.

As investment funds seek outlets, they may go into projects which are not too well planned and which, eventually, will lead to business failures and overcapacity—redundant and competing shopping centers, for instance.

There were no positive expressions of what additional information would have led to firmer convictions about policies to be pursued.

I believe the response to the questionnaire indicates that economists feel the government must assume responsibility for providing statistics and research necessary to decision making, both public and private, in order to "promote maximum employment, production, and purchasing power."

Yes, private research should be encouraged. The federal government ought not to try to take over all statistic gathering and research. When trade associations and industries gather facts, fine. But if it happens that an important segment of industry is "unguarded," then the federal government must gather the information. The cost of gathering information is small relative to the cost of unemployment and the psychological shock of a swift, sudden decline.

The 1937-38 slump is a case in point. Had we known more about sales, new orders, and inventories, perhaps we would have been wise enough to have prevented the economic heartache. In 1936 and in 1937, the Federal Reserve Board raised reserve requirements and tightened credit when industry was running out of new business. At the time, we had virtually no satisfactory data on new orders, sales, or inventories. It is possible that government policy aggravated the 1937-38 readjustment—one of the sharpest and swiftest on record. Immediately after the drop, many agencies—the National Industrial Conference Board, private research organizations, and the Department of Commerce—decided to plug the gap. Information on new orders, sales, and inventories was the statistical rage!

The answers to my questionnaire are significant in this regard. The emphasis on better construction and housing data and the emphasis on new orders, sales, and inventories hark back to the two most recent and important slumps: the Great Depression of the thirties, in which the falling off in new housing was one precursor, and the slump of 1937-38. These emphases are understandable. Men remember what hurt or fooled them most recently. This is the stable-door method of preventing depressions. You close the statistical gap of the last depression.

We cannot neglect the indicators, the barometers, which might have given us foresight in previous declines, but neither dare we assume that the causes of earlier depressions will repeat themselves in the same

ways. In a changing economy, men's excesses, which cause slumps, take new forms. Economists and statisticians—particularly those in government—must be ever alert to changes in the character of the economy and statistics so as not to be beguiled.

We all know how statistics lose their meaning. Once, carloadings was considered a significant indicator of business conditions. But during the twenties freight cars became larger. Carloadings did not reflect the increase in traffic of the period. Just when we became adjusted to this shift—we allowed for the increased tonnage per car—the truck became an important freight mover. Carloadings then declined, not only because cars were more capacious, but also because freight was moving over highways instead of rails.

Consider pig iron. The stock market used to rise and fall with it. Now it is obsolete. Steel has taken over as the nation's work-horse metal. Yet even this is changing. Steel is not so dominant in metal-working as it once was. Aluminum is up and coming. Once we reckoned aluminum in pounds. Now it is a tonnage metal. And it is used in operations which usually require more machine-hours than steel—in airplanes and airplane parts, for example. As aluminum increases in importance, steel may decline in importance as a statistical guidepost.

Business failures are another indicator which may be undergoing a change. This is the era of the large corporation. Business firms have branches in many places. The small family-owned firm represents a decreasing percentage of total assets. And since the small firms are more likely to fail than the large firms, business failures may be less sensitive as an indicator of economic change than formerly.

Let me try to illustrate this. You have probably read that John Wanamaker's has closed its New York store; that Alexander Smith & Sons, carpet manufacturers, is shutting its Yonkers plant, which was built during the Civil War; that Gotham Hosiery has abandoned its knitting mill in Philadelphia; that International Shoe shut a plant in Manchester, N.H. In the twenties, each of these plants would have been a corporation or a company by itself. Each closing would have entered the bankruptcy or business-failure totals. And as a result of such shutdowns, creditors would have uncollectible accounts. That is not so today.

These are business failures of a type. An establishment is outmoded. Trade has passed it by. Equipment is inefficient and obsolete. A bigger plant has been erected by the parent company elsewhere. But no bad debts result. The parent company is still solvent. Yet the local area is directly affected. An employer is moving away. Disemployed workers will have to find jobs in other companies in the area or move away. Personal distress—nonpayment of bills or defaults on mortgages

—will result. The local impacts are pretty much the same. Yet the failure at the local level does not register in the business failure statistics.

We know more than we ever did about what makes our economy tick. We have more statistics, more information, better-trained statisticians and economists, and better mechanical equipment. But we also have a far more complex economy with which to deal. And we know that economists differ on when and how to cope with inflation and deflation. If we knew, really knew, there could be no difference of opinion. We know some facts, but not all the facts. Hence we interpret the facts we know differently. When all the facts about a problem are on the table, the answer dictates itself.

Not only do differences develop about how to achieve maximum production and employment, but differences develop over the methods for detecting changes in the level and "quality" of business. Some economists study the behavior of business indicators, such as business failures, steel operations, new orders, sensitive commodity prices, new incorporations, paper board production, lumber production, housing starts, and so on. By analyzing each series, they hope to detect declines or upturns in business early enough to permit government action to prevent either inflation or deflation. And among this group, there are differences over the relative importance of the so-called "barometers."

Another school of economists relies on models—economic models, not Conover or Powers models. Attempts are made to estimate the gross national product by making projections. These projections are aided by data which possess a "forward look," such as the SEC-Commerce compilations on plant and equipment expenditures by industry, the University of Michigan studies of consumer-spending plans, and so on. Sure, the parts of the economy are interrelated and the forward-look components help to indicate direction and total expansion or contraction. But here again the accuracy depends on the assumptions the model builder makes and on the reliability of the forward-looking data. Sometimes estimates based on surveys turn out like the election polls.

Federal budget estimates, which ought to be dependable, have been off the target—even over comparatively short terms. As one recent example, in January, 1954, the government estimated that tax receipts in the fiscal year starting July 1, 1954, and ending June 30, 1955, would amount to 62.7 billion dollars. But by September, 1954, the estimate was lowered 5 per cent, to 59.3 billion. That change, of course, could be attributed to events not fully anticipated—to changes in business conditions and the tax law.

The government did not do too well in its estimates of its own ex-

penditures, either. In January, 1954, the estimate of spending for the 1955 fiscal year was 65.6 billions; in September, only nine months later, that was revised downward by 1.6 to 64 billion which is not too bad. But we do not know what the actual results will be by the time June, 1955, rolls around. In this instance, the forecast of reductions in tax receipts and expenditures is partly offsetting. The errors almost canceled one another.

But errors can be self-reinforcing instead of counterbalancing. Then the model goes way off. This is its nature. An assumption in one sector of the economy often influences assumptions in other sectors. As an instance, if you estimate that government outlays on defense will drop, you might also assume that consumer purchases will drop because of resulting unemployment. This partially explains the forecast of eight million unemployed in 1945 and 1946. The economists in the Office of War Mobilization and Reconversion knew government outlays would drop. But they underestimated the speed with which industry would reconvert; hence they overestimated disemployment and underestimated payrolls. As a result, low estimates of consumption, production, and employment were all in the same direction.

Each economist is bound to have his own predilections—his own methods—in trying to forecast business changes and in trying to formulate government policy to abet a high level of employment and a rising standard of living. I do not believe that the government can afford to rely solely on the barometric approach or model building for forecasting. Both are necessary.

Furthermore, in the effort to determine what action the government must take to influence the course of business, a model is essential. Both the analyst and the policy-maker want to know whether construction needs bolstering, or consumer purchasing, or business outlays. The model suggests areas in which government support is needed to achieve a high-level employment.

The model builder is like Professor Higgins[3] in Shaw's *Pygmalion*. Just as the Professor tried to correct and recorrect Eliza Doolittle's speech so that she could pass as a lady, the economist builds a model of what is likely to be. Then he recasts it—according to his conception of perfection. Government policy then is directed to obtaining this ideal. If the policy is correct and successful, the resultant model, like Eliza, is the modeler's dream.

Under the Employment Act, the government must engage in constant business cycle analysis. The Council of Economic Advisers takes

[3] Not to be confused with Benjamin Higgins, author of *What Do Economists Know*, a charming, clarifying set of five lectures.

the lead in this, assisted by the many research and statistical agencies of government, the Department of Commerce, Bureau of the Census, Federal Reserve System, Bureau of Labor Statistics, and so on. This has immediate application to current business conditions and fiscal policy.

But government must not stop there. I think it ought to undertake —directly or through private research organizations—studies into long-term economic trends or contingencies. I have in mind studies such as the Paley report on America's resources. We have to review periodically the long-term prospects for supplies of basic commodities, such as petroleum, iron ore, copper, aluminum, and so on, to determine our competitive position vis-à-vis the rest of the world. We talk about the possibility of becoming a have-not nation. We must also study the dangers of becoming a high-cost nation.

Likewise, it is desirable for the government to continuously examine the economic consequences of postwar technological improvements, of automation. Are we on the threshold of a great expansion in output per man which will make the forty-hour week obsolete? Will that result in large-scale unemployment and an economic crisis? Or will the labor unions exert countervailing power on industry and obtain reductions in worktime at rising hourly rates to offset increases in productivity?

The government might also want to make continuing studies of consequences of the great flow of savings into savings institutions. Raymond Goldsmith has worked on phases of this problem. Will insurance companies, savings banks, and other institutions be so pressed to invest funds that they will become parties to industrial and commercial overexpansion?

We have to keep abreast of the effects of an aging population on production and consumption and the tax burden on the younger population. We also will want to study the impact on the economy of the increase in babies. In the next ten years, will we need more schools, factories making children's clothes, etc.? Not only does gross population have an impact on business, but so do its segments. In our emphasis on the aged, on geriatrics, we must not forget the economic influence of the younger generation.

Government fiscal policy, itself, calls for special long-term research. We have certain theories about the effect of taxation on consumption and investment decisions. But are they justified? Do high corporation taxes, for example, discourage business investment? Or does business merely pass along the taxes to the consumer and, for purposes of reinvestable funds, hold back earnings from stockholders?

Similarly, it would be well to re-examine the effect monetary policy

has on the business cycle. We assume easy money encourages businessmen to borrow and to expand and that high interest rates have the opposite effect. How valid is that?

Another long-term research project would be the relationship of the farm and urban populations. The government has to support farm prices today because of surpluses. But is it possible that the increase in mouths to feed and bodies to clothe in the decade ahead will result in an enlarged demand for foods and fibers, thus increasing the economic bargaining power of the declining number of persons who remain on the farm? Is the farmer moving into a new strategic position—from political to economic strength?

Other subjects which might come under the government's purview are the expansion in state and local debt. In the next five or ten years, the burdens assumed by states, cities, and towns in providing hospital, school, road, police, and fire services could create a taxpayer crisis. Could they also cause a financial crisis?

I also think that the sale of revenue bonds—for the building of roads, schools, and other civic improvements—is a source of potential financial danger. We are creating in the United States state-sponsored enterprises which have the benefit of tax exemption. Yet the service of these bonds—the payment of interest and the building of sinking funds—depends entirely on income. If for any reason a road is poorly planned, the bonds would default. Is this device abused? And could it result in a loss of faith in municipal and state credit?

Long-term research has this advantage over short-run analysis. It lifts minds and imaginations out of day-to-day detail. Secular changes are observed. New economic probabilities can be dreamed of in the freedom of not trying to find solutions to immediate problems. The present is better understood for knowing the past and peering starry-eyed into the future.

At the outset, I alluded to the difficulties of forecasting, yet the necessity for it. If a business decline occurs when Congress is out of session, it would be months before Congress could act—even assuming the President were to call a special session. Therefore, it would be well for us to introduce greater automation and flexibility into our anti-depression armory so as to depend less on prophecy.

We have certain flexibilities now. The graduated income tax is a negative form of flexibility. As personal incomes drop, the burden of taxation falls. Similarly, as corporation earnings decline, the corporate tax burden is reduced. The government shares about half the drop in pretax income. Such automatic reductions in taxes cushion the severity of the business decline. But they do not increase income. They are not contracyclical in effect.

Unemployment compensation also is automatic in response to a recession. Workers are laid off. Their incomes do not collapse. Old age pension payments also come into play. Persons who are entitled to pensions who lose jobs can draw on their pensions after unemployment compensation is used up. Thus we have automatic income-supporting measures.

But what if these are not enough? What if the decline proceeds rapidly?

We ought to give serious consideration to empowering the President—or the President in consultation with a Congressional committee—to take positive action to lift income when Congress is out of session. For example, we talk of the need for a continuing shelf of public works—to be spread around the country when unemployment rises. But building highways, constructing public buildings, dredging rivers, and expanding research all require funds. Ought we to set up a special reserve fund of two to five billion dollars to be used by the President at his discretion or on some automatic signal, say, when unemployment reaches five million. (Herbert Stein, of the Committee for Economic Development, has gone into economic automation in great detail.)

Similarly, should the President have standby power to reduce the tax rate in the lowest income bracket, so as to immediately increase the amount of income available to persons who have jobs and whose incomes have not been reduced? Should he be permitted to cut certain excise taxes? These actions would be contracyclical in effect.

Congress is always reluctant to give the Chief Executive discretionary authority. (Probably it will take a crisis to jar Congress loose from this reluctance.) Congress might be more receptive to this idea if some Congressional strings were attached. Suppose a small, special, standby committee were established to act with the President if an emergency develops while Congress is out of session. This committee might consist of the majority and minority leaders of the House and the Senate, the two ranking members of both parties on the two Appropriations Committees, the House Ways and Means Committee, the Senate Finance Committee, and the two Banking and Currency Committees, and the Chairman of the Joint Committee on the Economic Report.

The methods for dealing with a recession would already have been set up. What would then remain to be determined by the President—or by the President and a Congressional committee—is the timing: when to put the measures in force. And a time limit should be established on tax reductions. The rates should automatically be restored at the end of a year—unless Congress legislates to the contrary in the meantime. (I am not suggesting an automatic anti-inflation program. That would require raising tax rates. I hardly think Congress would

grant the President or a committee power to notch taxes up—even within limits.)

The purpose of an automatic antideflation program is self-explanatory: to anticipate unanticipated changes in business conditions. It would be a stopgap, pending the convening of Congress and the enactment of formal legislation to meet the specific problems. It would take the burden off the Council of Economic Advisers to forecast correctly six months to a year ahead.

I have one further point to make on economic research and public policy. I propose a new agency—a private agency—to be the private counterpart of the President's Council of Economic Advisers. I think it ought to be financed by a foundation, such as the Rockefeller, Ford, or some other organization interested in the social sciences. It would report to the public at large. Its function would be to analyze economic trends just as does the President's Council. It would appraise the Council's report to the President, the President's report to Congress, the policies recommended by the President, and the economic effects of Congressional legislation. This private council of economic advisers would have the responsibility of analyzing public statements of government officials—the President, the Secretary of the Treasury, the Secretary of Commerce, and so on—to determine their validity.

Such an independent research organization is necessary because of the institutional character of government research and government policies. Within government, there is freedom to criticize and argue. But once an executive determination is reached, once a policy has been set, the critic, if he is to remain in government service, is silenced. He must then become a conformist. He must be on the team. In this, government is no different from a corporation.

This institutionalization of attitudes within government has dangers. Take a simple example. A budget is developed. It calls for a certain level of taxes and outlays. It is argued back and forth. Finally, it is adopted. Some government economists may feel that expenditures are greatly overstated—that the Department of Defense may not be able to let contracts as rapidly as the budget implies. That being the case, the income-supporting implications of the budget are exaggerated. Therefore, they feel that the Council of Economic Advisers, the Department of Commerce, and other government agencies should discount the budget.

But here is an authoritative document. It is the President's final word on income and outgo. How can government economists argue with *the word?* Department of Commerce or Department of Labor economists cannot make brash statements about the budget being unrealizable. They have to accept it. Most persons in government do ac-

cept it. After all, a good many worked on the estimate. So it becomes imbedded in economic analysis. And since government outlays constitute about 15 per cent of the gross national product, the budget becomes heavily weighted with a fixed concept.

That is not the worst. Government tends to develop and parade a Pollyanna attitude. No President, Secretary of the Treasury, or Secretary of Commerce can make a public statement that business is not going to be good. Official statements—from those of President Hoover to Presidents Truman and Eisenhower—have ever been in an optimistic vein. The government has the responsibility of seeing that business is good. If it is not good, then it must try to help make it good. To proclaim poor business might create poor business. (The forecast of eight million unemployed in 1945-46 is the exception. Here the purpose was to impress on Congress the need for legislation. Also, it was a special situation—reconversion from the war.) Certainly, therefore, the public expressions of persons in government tend to be optimistic. And these opinions are the ones that are communicated to most persons. Doubts are communicated in private discussions, perhaps, but propriety calls for the "good word."

This is a political necessity. Every two years the government stands before the voters—in the Congressional elections. The party in power does not lose by glossing over unpleasantries. It keeps a stiff upper lip, regardless. That is the nature of the government: openly optimistic, regardless of what sober discussions go on in the inner councils. And that can have a self-mesmeric effect. Persons often think the way they talk!

Therefore we need a countervailing research power against institutional optimism: a nonpolitical organization whose sole objective would be to make a review of government economic statements and policies, not for the purpose of being critical and opposed, but for the purpose of being analytically objective. It could agree as well as disagree with government statements and legislation. Nor would it complain if government failed to follow its suggestions. It would look to the future, not beat dead horses.

No organization in existence today satisfactorily fills the bill. The Joint Committee on the Economic Report was set up by Congress for this purpose, but, unfortunately, the two-party system is not conducive to impartial research and reports. On critical issues, this committee usually splits.

Grover Ensley, staff director of the Joint Committee, did a remarkable job in developing a "joint report" on the President's 1954 *Economic Report* to Congress. But even then there were several exceptions and special points of emphasis by the Democratic members. And I doubt that even Ensley's exceptional diplomatic skill would be able

to get a truly joint report during a period of acute difference of opinion on ways and means of coping with either inflation or deflation. These reports tend to be compromises rather than objective analysis. If there were ever the prospect that the President's report were to be a major campaign issue in an election year, the chances of committee agreement would, in my opinion, be nil. Regardless of the objectivity of the committee's staff, the committee itself cannot be entirely objective. So it cannot perform this function.

Research organizations which sell their services often develop material which differs from government projections and policy. But such findings are limited to clients. The National Industrial Conference Board does some work in business analysis, but it has other functions and it depends upon subscriptions from business organizations. The National Bureau of Economic Research has the personnel for a task of this type, but it is devoted to long-term research rather than analysis applicable to immediate economic developments. It would not say "boo" on current events.

Labor research staffs frequently criticize the administration's program, but these criticisms are as much political as economic. Banks publish monthly reports on business, but are seldom single-mindedly devoted to business cycle analysis—with the purpose of informing the public about the strong and weak points in the business prospect, the efficacy of government policy, and the need for changes, if any. There is no lack of critics and analysts of government policies. But there is no organization set up for the specific purpose of making studies of cyclical progress and problems.

This organization would have to be headed by an outstanding economist—a person who could command the respect of economists of the New Deal-Fair Deal school and of the so-called "more conservative" school. (Professor Higgins classifies economists into four schools: the Latter Day-Laissez Faire, Keynesians, Marxists, and Institutionalists.) I am putting my stress here on political leanings rather than method or approach to economic analysis.

The organization would need a competent staff comprising specialists in government finance, banking, industry (broken down into hard goods and soft goods, with subdivisions for important sectors, such as automobile and steel), consumer savings and spending, building and construction, state and local government plans and outlays, etc.

A staff such as that of the Federal Reserve System would be ideal. The Federal Reserve, however, has to be looked upon as a branch of government. It cannot issue independent statements. Reserve research must be directed toward assisting the Board in making policy decisions which are co-ordinated with the policies of the Treasury. Thus complete research independence is neither possible nor, for that matter,

permissible. What is needed is a critic-commentator of government economic policy—a research group which would commend when policies seem wise, which would point out dangers if policies and statements seem unwise or impetuous.

Such a group is required because the government today commands more economists and statisticians than any other organization. Size equals power. The fact that recent results of the Council of Economic Advisers have been excellent does not guarantee the future.

Such an independent organization, with a strong board of directors, would command the attention of the President, his advisers, and the Congress. Its observations would alert persons in and out of government to shortcomings in government concepts, projections, and policies. It would remind all of us that the government's word is not absolute. It would guard against a stampede of monogenous opinion, fostered by government, which could lead to boom and then, perhaps, bust. Furthermore, it would furnish a yardstick against which to measure government forecasts. This organization, even as the Council, would put its judgment on the line in its reports and observations. Its survival would depend on its record—on the help it gives to all of us in understanding the economic currents and crosscurrents.

To summarize:

1. The government must undertake to improve existing statistics and develop any statistics necessary to increase understanding of the economic world we live and will live in. That is a virtual mandate under the Employment Act.

2. Statistics will not supplant judgment, however.

3. Long-term research is as much a government responsibility as short-term analyses of the business cycle.

4. To make up for the shortcomings of forecasting, we should invest the President with limited powers to undertake contracyclical action when Congress is not in session.

5. A counterpart of the President's Council of Economic Advisers should be established outside government to provide objective analysis of government plans and projections.

I think we are all humbly aware that the past is dead, the future is unborn, and the present is imperfectly understood. Sometimes I am sure we shall conquer the business cycle, that we shall limit declines to short periods of time and modest percentages. But I have doubts, too. At such times, I fear that not until after the next crisis will we know what kind of research we should have had to prevent it. But that does not mean we do not need research. We most decidedly do—better research and better judgment.

DISCUSSION

EWAN CLAGUE: At the outset let me emphasize that this is a good paper. Mr. Livingston asks the right questions, discusses the right issues, recognizes the handicaps and the necessities of forecasting, and makes some important suggestions.

My first comment is to indorse wholeheartedly Mr. Livingston's call for better statistics. Among those needs which were ranked highest by the economists was better construction statistics. This priority is correct in my opinion. Both from the seasonal and cyclical points of view, construction is probably our most important industry. At year-end in 1954 the economic situation would be quite different if the construction industry, instead of reaching new heights of activity, had turned downward. The recession of 1949 was counterbalanced in the same way.

Yet the statistics on construction are among the least satisfactory in our whole kit. The housing starts series of the Bureau of Labor Statistics has recently been revised and is now in excellent shape. However, it is a national series only. There are no corresponding data for localities, metropolitan areas, states, or regions.

There is no longer any data—national, state, or local—on the major characteristics of building, data which we formerly obtained. These would include the prices, the sizes, the materials used, etc. Correspondingly, we need information on the major characteristics of the buyers and renters, such as their previous residence, income, family size, etc.

Then, too, there was formerly a survey of builders which yielded information which should be of great value in forecasting the outlook for construction. This included the land holdings of builders, their building plans, recent sales experience, and their inventory of materials.

The data on dollar volume of construction put in place are fairly good, although they have some very important weak spots. Information on the construction of private nonresidential building, such as offices, factories, hotels, etc., needs revision and improvement; likewise the data on state and local public construction, which we are counting on to buoy up the economy during the next few years. We need and ought to have a good nationwide monthly series on the value of construction work started as well as on construction put in place.

Finally, there is urgent need of a good series on construction costs. There are some private series, but these are both limited and incomplete, and are based largely on the wages of building labor and the price of building materials. Over a long period of time these two will overstate building costs because there is no allowance for increases in productivity. What is needed in this field is nationwide coverage of various types of building structures and with some allowance for productivity increases.

Next, I should like to comment briefly on the problem of the establishment

of good government statistics. Government statisticians are competent practitioners and their integrity has been demonstrated time after time. There is no occasion for any criticism of government statistics on either of these bases. With respect to some other points, however, the situation is not so good. In general, there is not adequate maintenance and repair of statistical series. In order to avoid the obsolescence of which Mr. Livingston speaks, it is necessary to keep constantly checking the quality and significance of the data collected in any field. Furthermore, when the quality deteriorates there should be funds for repair and revision. This requires adequate funds specifically provided for this purpose.

Another weakness of government statistics is inadequate analysis and interpretation. This is not an exclusive function of government since there are many outside users, but in the first instance a minimum amount of analysis and interpretation is absolutely essential. Furthermore, this should be done by the collecting agency, since they are the only ones who are constantly in touch with the original data. Raw data are often misleading, as, for example, in unemployment compensation where the weekly claims figures often vary, not because of changes in unemployment, but because of administrative factors. The originating agency is the only one which can properly interpret these changes for the general public.

Finally, for a number of years public attention has been called to the gaps in government statistics. The Congressional Joint Committee on the Economic Report has called attention to this problem. Two things are needed: the elimination of series which are obsolete and the development of others which are urgently needed.

In conclusion on this point I should like to emphasize that in government statistics the public gets what it is willing to pay for in accuracy, frequency, and promptness of publication. Of course, there can be economy in statistical work—the development of sampling in recent years is clear evidence of that. However, there are limits beyond which it is not possible to go. It is the responsibility of the statisticians to make clear to the public the limitations on the data being published and the requirements for improvement.

I want to comment briefly on differences of opinion among economists. Mr. Livingston says that economists differ widely, but if we only had all the facts the answer would dictate itself. This is not quite true. There is one factor missing; namely, the value judgment of economists. For example, in an economic downturn some economists might favor a little inflation (or at least reflation) while other economists might recommend deflation (or at least letting things alone). Suppose that the eventual outcome would be exactly the same and a business recovery would take place. However, some people, including economists, will prefer the first solution while others will prefer the second.

These differences have nothing to do with economic analysis but only with personal preferences. Economists ought to watch this more carefully, since the public interprets all these differences as indicating the complete lack of any basic economic principles. My point in connection with Mr. Livingston's paper is that there is little use in gathering more facts and

"sweating out" more analyses if the differences of opinion are due solely to personal preferences and value judgments.

I want to say a few words about Mr. Livingston's remarks on forecasting by government officials. I do not take as dim a view as he does.

In the first place, all forecasting, if widely believed, tends to affect the results forecast, either directly or adversely. For example, if a high government official should forecast a sharp business depression (and publish it), he might possibly induce a recession through popular response to his forecast. (Perhaps this greatly exaggerates the influence which people generally would give to official judgments.)

Another example occurred this year. The outlook for home building took a little downturn in early 1954; so the government passed legislation facilitating the consumer purchase of homes. As a result, the downturn in the first half of 1954 was converted into a sharp upturn in the second half. So the forecasts of early 1954 had to be revised in the light of action to prevent their taking place.

Finally, I think that the reassurance by the President of the United States that the Administration would act forcefully to prevent a real business depression undoubtedly influenced the economic situation. Since the government has powers and resources capable of producing significant economic results, the business world can and does act on such reassurances.

I am not referring to Pollyanna statements which government officials may make concerning what business will do. I am referring to those statements which indicate what the government itself will do, on which government officials presumably have good judgment.

Finally, I should like to say just a few words about time and timing in economic policy. We economists have a most important obligation to make clear to the public the significance of time in economics. I stress this because the layman tends to expect results immediately. Even the economic actions which produce the quickest results take some little time to bring about those results. Some far-reaching policies may take months, or even some years, before their influence is fully effective. So we have not only the difficulty envisaged by Mr. Livingston; namely, that government policy-makers have to gauge the time allowances of their policies and therefore must strive to be forehanded in their actions. We have also the additional complication that the public does not always understand the time requirements and, therefore, will express impatience or dissent from policies which will work out all right, given a little more time. If I have any one suggestion to make, both to government economists and to those in business and other fields, it is that they try to keep the public informed on this crucial point.

Grover W. Ensley: I like the realism and insight of much of Livingston's presentation. I would underscore his statement that "in a society in which the government assumes responsibility for economic stability and high employment, forecasting becomes a part of the public domain." It is well to remember in our discussion, of course, that the federal government does not guarantee "stability and high employment," but rather to use its resources

and powers in co-operation with "industry, agriculture, labor and state and local governments" to that end. Under the circumstances, I would certainly agree that "national policy cannot be made without some assumptions about the future." Although we could quibble over the meaning of words like forecasting, projections, and assumptions, whether we forecast or not is academic today. The only question is, how can we improve our forecasts? This idea, of course, was clearly recognized in the Employment Act of 1946 and in that Act's prescription for the President's annual *Economic Report.*

The Joint Economic Committee has prepared and published a nation's economic budget annually for several years, not as a forecast or prediction, but rather as a projection for the next year of levels of economic activity needed to achieve the objectives of the Employment Act and to show the nature and magnitude of adjustments from present trends and plans and expectations needed in order to achieve the objectives. (H. Rept. 1256, 83rd Congress, 2nd session.)

No matter how good the process of forecasting or projecting may become, however, economists should not expect prompt compensatory legislation to result solely from a prediction by the Council of Economic Advisers, the Joint Economic Committee, or a private economic supreme court, that a turning point in economic activity will come at some given date during the coming year. Under many such circumstances we can only prepare in advance to legislate speedily at a time the turning point becomes evident, relying upon monetary policy, the built-in stabilizers, and administrative flexibility to cushion and to provide corrective forces against the initial effects of an unfortunate turn-around.

I would go along with Livingston in granting administrative discretion for increasing and decreasing public works expenditures within certain limits. I would suggest, however, that the Congress is often more sensitive to the needs for making tax adjustments than the Executive. And I am not as pessimistic about special sessions of Congress if need for economic legislation arises.

Livingston correctly says that the government must not stop with short-run analyses. It ought to undertake "studies into long-term economic trends or contingencies." Our Committee has given emphasis to this type of research. Several staff reports have focused on the long-run outlook. The most recent of these reports—released in November—was titled: "Potential Economic Growth of the United States During the Next Decade."

Naturally, I liked Livingston's reference to the recent hearings and report of the Subcommittee on Economic Statistics of the Joint Committee. All of the witnesses at these hearings placed the then pending census appropriation bill at the top of the "must" list. The subsequent appropriation to carry out the census of business and manufacturing resulted, in large part I believe, as a result of this testimony.

The Subcommittee report (H. Rept. 2628, 83rd Congress, 2nd session) also placed a high priority on four additional areas; namely, savings, inventories, consumer expectations, and business intentions. At the Subcommittee's request, the Board of Governors of the Federal Reserve System has created

five task groups of outstanding technicians to make exhaustive studies of present data, concepts, and sources and to propose practical programs for improving information in these areas. Information on the nature and scope of these studies was released by the Joint Economic Committee last week.

The President's program to be unfolded to the Congress in January, 1955, will propose significant steps forward in our statistical programs, based, in part, on the hearings and report of the Subcommittee on Economic Statistics. The profession and other private users will all need to get behind this program and see that it is legislated.

I have only one real disagreement with Livingston's paper. It deals with the recommendation that there be created a "private counterpart" to the government's Employment Act agencies. He puts it in terms of "a countervailing research power against institutional optimism." At the outset, let me make clear that we are for private economic research to supplement and assist the Council of Economic Advisers and the Joint Economic Committee in carrying out their statutory responsibilities. The Employment Act recognizes the important role of private research. We know of the good work of the National Planning Association, the Committee for Economic Development, the Twentieth Century Fund, and the many, many other private agencies.

But I would be very skeptical of recognizing one of these agencies as being the institution to which we must turn as sort of a supreme court of economics, even though their views were not binding. I am a little uncertain as to who is supposed to appoint or designate this private economic council of supermen with their priestly powers to issue oracles. I raise this point because it seems to me that the entire proposal for such a private institution as official critic of government economic analysis and policy is in conflict with American principles of responsible government. We have always conceived of agencies performing functions upon which governmental policy is to be founded as necessarily being responsible to the people. Suppose for the moment that we had had such a private council a year ago. Suppose, also, that it would have been headed by as disinterested and objective an economist as Professor Colin Clark. Now if Clark's dire and ill-founded predictions and corrective program of a year ago had been followed, the resulting embarrassment would have plagued the party in power for years; yet our friend Clark would have escaped almost unscathed back to the cloisters of Oxford University and temporary oblivion. An irresponsible economist can live in oblivion, but a responsible political party cannot.

Livingston is concerned about the objectivity of government economic research. He correctly does not question the professional competence and responsibility exhibited by the rank and file of government economists. On this we certainly agree. I know of no more able, sincere, nonpartisan, objective —and I might add underpaid—group of technicians than in the federal career service. I am sure the economic profession regrets the wringer through which the career staff of the old Council of Economic Advisers went in the spring of 1953. Thanks to the professional standing of the three members of the present Council, restoration of a professional staff was possible. A bad precedent, however, has been established in that executive agency.

Perhaps the party line must be followed in the Executive Branch, once a decision or recommendation has been formulated, but the Executive is just one branch of the federal government. There is the Congress where the final policy-making power rests, and no one can charge that the Congress always follows a party line. Furthermore, minority reports are useful in explaining opposing views to the public.

I do not believe the facts bear out Livingston's statement that all government operates in an optimistic vein. That has not been true of all Council reports, nor has it been true of the Joint Economic Committee reports and staff materials. Livingston himself refers to the pessimism of the Administration in 1945 and early 1946. The Administration was seriously concerned about inflation in 1948. I believe the Joint Committee's hearings and report of February, 1954, dampened somewhat the optimism expressed in the President's *Economic Report,* and put into better perspective the need for tax revision—including one billion dollars of excise tax reductions in the face of Administration opposition, more liberal highway and rural electrification authorizations, farm supports, liberal housing, and social security programs.

It is important, of course, for government to provide courageous leadership. In so doing it may give a confident air with respect to the economic outlook, but this can certainly boomerang with resulting loss of public confidence if based on unfounded or false optimism—and successful public officials realize that fact.

For the very reason that elections come every two years, our elected representatives are alert to reality. As a matter of fact, I doubt if any group is more alert to reality than elected public officials. Livingston said: "The party in power does not lose by glossing over unpleasantries." But it does not win by glossing over unpleasantries, either, and the unemployed congressmen walking the streets every other November prove it!

The Joint Economic Committee is criticized by Livingston for "usually" splitting along party lines. But this was not true of the rather historic report of the Douglas subcommittee in the spring of 1950, when it recommended that a flexible monetary policy replace the rigid one. It was not true of the Joint Committee in July, 1950, when it unanimously recommended an immediate and substantial increase in taxes to offset the inevitable inflationary pressures brought on by the Korean war. It has not been true on countless other issues dealt with in Committee reports over the years.

It is to be expected that the underlying and differing economic philosophies of the two major parties should come out in Committee reports. But if there is an emergency with clear-cut evidence of marked inflation or marked deflation—and we have seen such emergencies—I am confident the Joint Committee and the Congress would reach a remarkably wide area of agreement on major economic policy in a sincere endeavor to deal with the problem. I am thinking about July, 1950. Also, had the recession not stopped last summer, we would have seen united action on antirecession measures. The most troublesome problem is formulating policy in a period of uncertainty with a mixture of trends and forces at work—when honest differences of opinion may be expected. Unfortunately, we have not developed anything comparable to the

"rabbit" test which will enable us accurately to predict economic turning points.

I dare say there is more difference of opinion on the economic outlook and economic policy among so-called "objective" economists than among congressmen. Until recently I would have hedged some in making such a sweeping statement because of the tariff issue. But I am not so sure now, having read articles and briefs written by a Harvard professor on the textile industry, a Dartmouth dean on the chemical business, and other economists on other industries and regional problems. Livingston gives economists a batting average of .500 on short-range forecasting. The fact of the matter is that honest men, objective men, differ as to what the economic outlook is and what appropriate policy should be. This is very desirable in an area in which there will always be uncertainty as to the facts and their implications. Disagreement and debate serve to bring out all the possibilities.

We have private research and economic interest groups and universities bubbling over with professional economists analyzing the economic outlook, criticizing, and recommending policy. We have the fourth estate, so ably represented at this session today. We have a form of government which encourages and guarantees this process. We are not short on outside and independent analysis and criticism and recommendations, and that is good. Our Committee doors are always open to economists who wish to give us the benefit of their thinking. The Joint Economic Committee's hearings provide an opportunity for all segments of the economy to present their views to the Congress. But it is the essence of our system of government that our democratically elected representatives synthesize these analyses and arrive at workable programs. That is their responsibility, and we can hold them accountable.

Stanley Lebergott: Josh Billings once remarked: "Everyboddy wants tew talk, few want tew think, and noboddy wants tew listen." We must, however, surely make an exception for this fascinating and thoughtful discussion by Mr. Livingston. I am going to address my comments to the questions which he asked in his survey and to the answers he listed.

What data are needed to develop policies for economic stability? The answers to his questions on this subject provide an interesting paradox. In Mr. Livingston's apt phrase, the respondents found that the federal government needed "forty different types of statistics." But when they came to their own needs, they found no gaps whatever: "There were no positive expressions of what additional information would have led to firmer convictions about policies to be pursued." Surely they must have overstated the government's needs or understated their own.

Let us, nevertheless, concede that we do have significant gaps in our statistical armory. I believe that the forty suggestions reveal an unfortunate hope—a hope that statistics can be so perfectly tailor-made that economic analysis would be pretty much unnecessary. Let us examine some of the needs that were mentioned. One is the lack of quarterly deflated GNP data. This is a gap indeed. But is it serious? Anyone who examines the basic data will, I

think, conclude that a cost-of-living index will do remarkably well for quarterly deflation of the GNP data between the available annual estimates. Another gap listed was "the number of unemployed persons not receiving employment benefits." But we can approximate trends in this group tolerably well by deducting the number who receive benefits (BES) from the number employed (Census). More data on industrial accidents were also demanded. Considering that Mr. Livingston's question concerned those data needs "which prevent or hinder the federal government in making effective policy decisions to maintain economic stability," one can only conclude that this suggestion was made in jest.

More detailed data on new orders, sales, and inventories? Indeed such data would be an advance. Yet considering the quality of our existing figures, it is somewhat surprising that the need expressed is for more rather than for better data. That needs for data do exist there can be little question. This survey points out some. But we would do well not to take what may be offhand opinions of twenty-six respondents as a very positive basis for judgment. We shall, in addition, want to review such considered statements as those of the Watkins Committee (to which Mr. Livingston made an invaluable contribution) and the admirably succinct summary of the data needed for making policy decisions on economic stability in the statement by the chairman of the Council of Economic Advisers to the Talle Committee.

Should government study the impact of its economic policies and study long-term trends? Asking such a question comes close to asking whether parents should get up early on Christmas morning to look at the children's presents: there is little alternative. The Treasury must study the state of the bond market before launching a new issue. The Reserve Board must evaluate general economic conditions at length to anticipate the impact of a change in reserve or margin requirements. The Secretary of Agriculture has to review the impact of a proposed set of parity prices for the forthcoming year, etc. However, it is clear that many of these studies will not be publicly available, as is, I think, implied in the question.

Moreover, while long-run analyses are made, they are undoubtedly not made as systematically and as coherently related to each other as is implied in Mr. Livingston's question. The Census Bureau, for example, has made long-term projections of both population and labor force. The Office of Business Economics has projected markets for a broad range of industries. Transportation activity has been anticipated by the ICC and by Public Roads. Forecasts of exports and imports have been made for use by international agencies, etc. In sum, a considerable amount of such work has been done. If I may interpret Mr. Livingston's question to that effect, a considerable amount should continue to be done, but perhaps more systematically, with greater integration and with more presentation of the results for broad public use wherever possible.

To Mr. Livingston's proposal for "a private agency, to be the private counterpart of the President's Council of Economic Advisers" I would say: "Come on in. The water is freezing, the bottom is rocky, and you'd better watch out for the old tomato cans." The more economists who address them-

selves to these problems the better. I am certain, for example, that reviews and judgments on the state of the economy made by Messrs. Burns, Jacoby, and Stewart would be of great value for government policy making even if they were outside government service, heading such a private agency.

I would add two limited comments. First, that if there is "a government economic line," as Mr. Livingston suggests, there is nothing like the uniformity of public utterance nor the restriction of data that this would imply. Read the *Survey of Current Business.* Read the *Federal Reserve Bulletin.* Read the reports of the Agricultural Outlook Conference. You will find them, perhaps, stuffy, reserved, in broad agreement. But they do differ. More importantly, they give the facts. They provide the basis for independent judgment by economists throughout the country. Moreover, there is considerable point in not seeking *a* single authoritative critic. In a pluralistic economy such as ours, is not there point to combining and balancing off the statements of both political parties (in the invaluable reports of the Joint Committee on the Economic Report), of the National Planning Association, the CED, the AF of L and CIO, the Chamber of Commerce and NAM, etc.? Each can give us an important perspective on the problem. Each has a significant contribution toward a combined judgment. (I would venture an incidental comment—which, however, does not detract from the merits of this useful proposal. Just as desirable as it would be to have another competent group of economists working in this area, so one could anticipate a gradual attrition of prestige if they were to engage in it: the prestige of economists is usually inversely proportional to the number of detailed predictions they make.)

On Mr. Livingston's final point—the desirability of an antideflation policy—I will not comment directly. The problems of an automatic policy have been well canvassed and this enticing subject is outside my bailiwick.

Although, as Mr. Livingston points out, such a policy would reduce the need for CEA projections, we will, of course, continue to need projections and forecasts. The Treasury, for example, will still have to forecast something like GNP, personal income, and corporate profits totals to make its forecast of government revenues.

In evaluating the need for such a policy, we would do well to consider what I would call the visible hand theory. I would not challenge Mr. Livingston's assumption that even with an automatic policy Congress would not grant powers which the President could exercise before five million persons were unemployed. Yet major steps were taken in 1954, without such a policy, when unemployment was under four million. I refer to the action of the Congress on excise and personal taxes early in 1954 and the program of the President adopted by the Congress in the Housing Act of 1954. In practice, Congress may be willing to support more substantial intervention in economic affairs than it would accept as set down in general premonitory legislation.

BERT SEIDMAN: The American Economic Association is to be commended for including the problem we are discussing in this year's program. It is a subject which should encourage us as economists to take our minds off detailed

problems in specialized fields and to step back for a moment and appraise our work as objectively as we can.

Mr. Livingston has set the stage for such a self-analysis by economists. His paper stimulates us to consider and appraise the role we economists can and do play in the formulation, principally by noneconomists, of public policy.

At the outset, I want to heartily endorse Mr. Livingston's emphasis on the urgent need to fill the gaps in statistical data. A number of investigations during the past year have concentrated on this problem. There is an increasing awareness, principally, but—I am happy to say—not exclusively, on the part of economists and statisticians, of the need for a wider range of and more accurate statistical information.

I particularly like the stress placed by Mr. Livingston on the disturbing fact that we do not now know which sector of the economy will be strategically most critical in a future period of economic stress and therefore we cannot be sure as to what types of economic data will be most needed. If anything, this should reinforce us in the determination to fill as many statistical gaps as possible.

If I had to put all my eggs in one basket, I would especially emphasize the need for more and better productivity data. It has become trite to forecast the tremendous technological improvements and concomitant rapid increases in productivity we will witness in the years ahead; but this is a case where repetition of a prediction does not detract from the importance of its implications. Since measurement of productivity changes is essential for determining labor and capital requirements as well as the production potential of the economy, it is most important that we concentrate now on improving and expanding productivity data.

If I had time I would like to elaborate on the types of statistics we most urgently need, but this is not our principal concern. Perhaps it is enough for me to agree wholeheartedly with Mr. Livingston that there are serious gaps in statistical and economic data which need to be filled in as rapidly as possible.

Now, what about this business of forecasting? Many economists feel that economic prognostication is greatly overemphasized, and that this is especially unfortunate in view of the tendency for the general public to regard the projections of economists as precise predictions. But regardless of the desires of professional economists, economic forecasting is here to stay. Moreover, we should not deceive ourselves into believing that economic forecasts are being made only by trained economists—whether in unions, banks, corporations, universities, or government. Actually, economic forecasts are also being made—often with no conscious realization of it—by literally millions of people who are not technical economists and know little or nothing about economic data.

Let me give an example from the field of collective bargaining. We union researchers are trying to provide as much data as possible for our trade-union constituents for collective bargaining purposes. We are gratified by the increasing use to which our economic data are put. But we are also aware that many unions, as well as many employers, particularly on the local level and in small plants, rely not on formal economic data but on their own feelings, intuitions,

or what have you, as to economic prospects when they sit down at the bargaining table.

Actually, many economic decisions of great importance—certainly of great importance in the aggregate—are made on the basis of just such lay judgments of the future of the economy by congressmen, consumers, farmers, businessmen, union representatives, and many others. Their decisions greatly affect the course of economic trends. Indeed, they may determine whether the projections made by professional economists are borne out by actual events. What should particularly give us pause is that, as Mr. Livingston has pointed out, since economists have had at best only a fifty-fifty record in this business of forecasting, our record may be no better than that of the millions of nonprofessional forecasters.

This may seem to be a defeatist and pessimistic note, but that is not my intention. Rather it seems to me that these facts present a challenge to economists. Since I have no great faith that the judgment or intuition even of economists can be appreciably improved, I would stress again the need for sharpening the tools of economic analysis available to economists. This does not mean that we should seek data for their own sake, but we should make every effort to obtain every bit of data we can get to aid our admittedly imperfect judgments. This means most urgently a halt to the attrition of the government statistical programs which, after all, provide us with the main body of statistical information we must have for effective research and analysis.

I react with mixed feelings to Mr. Livingston's suggestion that the government has a responsibility to engage in long-term economic research. Some long-term research by government agencies is certainly desirable both as a means of making more useful and meaningful the short-term data collection, research, and analyses of these agencies and also to contribute to a more general understanding of fundamental economic problems.

On the other hand, it seems to me that precisely because the government agencies cannot, by the very nature of their status, achieve complete, or even nearly complete, objectivity, I question whether we should place our main reliance on government for studies of long-term economic problems and developments. I would hope that our major source of light on such questions would continue to come from the universities, the National Bureau of Economic Research, and other independent groups.

Mr. Livingston's fourth point—his recommendation that the President be given limited powers to undertake emergency antideflation action—was not included in the preliminary draft of his paper; but if it is an afterthought, it is an extremely worth while and constructive one. While I am not prepared to comment in detail on his suggestion, I do think its implementation would strengthen our economic armory. The President's hands are not completely tied, and there is some grounds for feeling that his existing authority has not been used fully or quickly enough. Nevertheless, his authority to combat incipient depression needs to be strengthened. I do think that the five million unemployment figure Mr. Livingston suggests is too high and that antidepression action ought to be taken before economic activity declines to that level. This is perhaps a detail—although an important one. But I heartily

agree with the general principle embodied in Mr. Livingston's recommendation.

This brings me to Mr. Livingston's intriguing suggestion for the creation of a private counterpart to the Council of Economic Advisers. My first impulse was to endorse this suggestion enthusiastically.

What Mr. Livingston has said about the lack of impartiality of the various private and governmental agencies engaged in economic research and analysis is certainly true. The biases of such groups are for the most part not conscious and are certainly not deceitful, but they do exist and they cloud the impartiality of their work.

I would certainly agree with Mr. Livingston that the President's Council of Economic Advisers labors under such a handicap. Dr. Burns might have thought when he became chairman of the Council that he could somehow maintain an Olympian impartiality and no doubt he has sincerely attempted to do so. But by now he has found that the Council—like any other agency of the government—is of necessity merely an arm of the Executive. This is no less true of Dr. Burns's Council than it was of Mr. Keyserling's, however more willingly Mr. Keyserling may have accepted that role. Moreover, we have seen that when Dr. Burns was unwilling to subordinate himself to the over-all policy of the Executive, as in the case of the so-called "Midyear Economic Report" issued by the White House last summer, he was simply brushed aside.

Is the answer to the admitted biases of the many existing agencies carrying on economic research and analysis and making economic projections a private council of economic advisers? As attractive as Mr. Livingston's idea is, I think that consideration of his proposal must lead to its rejection.

First of all, how do you get a body which would have the universal acceptance which Mr. Livingston rightly feels it would need? Is it really possible to find to head this organization "an outstanding economist—a person who could command the respect of economists of the New Deal-Fair Deal school and of the so-called 'more conservative' school"? I have very grave doubts that such a person actually exists or that he would long retain such an exalted status if required to assume the task Mr. Livingston would assign to him. Nor would the job of assembling a staff of experts in various fields with the same measure of universal acceptance be an easy one.

Let us suppose that somehow these hurdles can be met. Do we really want to have any economist or group of economists—regardless of how expert, respected, or accepted—placed in a position as the final arbiter in questions of economic analysis and forecasts? I, for one, prefer the existing situation where consumers may pick and choose among economists and their wares and select the product which will best meet their needs for economic information.

I have the very strong feeling that if we were to accept Mr. Livingston's proposal for a private council of economic advisers, we would simply be jumping from the frying pan into the fire. Mr. Livingston urges his suggestion on the grounds that "it would remind all of us that the government's word is not absolute." He tells us that the new organization "would guard against a stampede of monogenous opinion, fostered by government, which could lead to boom and then, perhaps, to bust."

It all sounds very fine. But what about the danger that the new organization

would have the very weaknesses that Mr. Livingston warns us against? Here would be a new fount of monogenous opinion on which government officials and other policy-makers would have every reason to rely because of its supposed absolute objectivity and exalted professional caliber.

Yet we all recognize that not even the best of economists is infallible. In fact, I doubt if even Mr. Livingston's private council of economic advisers would better by much the .500 batting average of the general run of economists. We must not run the danger of establishing an organization which will be virtually immune to criticism when we know full well that it will not always be right. Rather than attempt to create a final arbiter in the field of economic ideas, I would urge that we direct our energies instead to improving the tools of economic research and analysis for the use of all economists.

MERRILL A. WATSON: The instructions for the panelists in this session, although clear, offered great latitude. We were told that the session was designed to present an appraisal of the adequacy of government statistics, particularly for the public and private purpose of business cycle analysis and economic stabilization. We were told further that we might discuss whatever we found challenging in the main speaker's paper and make whatever comments we wished. My discussion of the speaker's paper will be from the viewpoint of the business economist.

The speaker has drawn five conclusions in his paper. The first, based on replies from twenty-five economists, is that the government must undertake to develop a better-equipped statistical armory. The second deals with the changing importance of economic data, the shortcomings of forecasting, and, above all, the need for judgment in the analyzing of data. In his third point the speaker emphasizes the need for long-term economic research by the government. Fourth, he stresses the need for greater flexibility and automation in our built-in shock absorbers and greater authority for the President. Fifth, a new private agency, a counterpart of the Council of Economic Advisers, is recommended.

I should like to comment first on some of the questions contained in the survey of economists. Certainly a few of the answers indicate a reaching for somewhat irrelevant data, although there is no use in debating that point here. One might, however, wish the respondent who stated that "we don't need more data; we need better judgment" had expanded on his views.

I am rather surprised that only a few of the economists surveyed emphasized the need for more current information on orders and inventories, particularly in private industry. There are important statistical gaps in this field. My own observation has been that there is a great need for more and prompt information of this type for forecasting purposes in individual industries. For example, in such private statistical-gathering organizations as trade associations there are very few groups which collect the necessary data for measurement, analysis, and forecasting of the short-term cyclical movements which we often term buying movements or inventory accumulations. A complete picture here, for example, would show the flow of raw materials, production of finished goods, sales, and inventories in dealers' hands for a manufacturing

group selling to the retail trade. It would be too much to hope for a measure of inventories in the hands of ultimate consumers. This information might be supplied by a weekly index of purchases of raw materials; a weekly index of new orders received for finished goods; and monthly data on production, sales, and inventories at the manufacturing level. When to this is attached a picture of sales and inventories of finished goods at the retail level, collected on a monthly basis, a fairly comprehensive "flow chart" for an industry is available.

Some experimentation in this field has indicated that such a flow chart will reveal not only the extent of inventory accumulations and shortages but also the turning points in short-term industry cycles. I might also say that to some of us in industry the collection of this type of information is a general goal. In far too many cases in manufacturing groups we have been placing emphasis on the collection of monthly information on production and inventories. This has provided a basis for historical measurement of long-term trends but has been of little value in detecting and measuring the short-term industry movements which plague many of the consumer goods industries.

I should not like to leave the impression that I believe that the filling of these statistical gaps and the developing of a flow chart of this nature will play an immediate part in curtailing or eliminating these short-term industry cycles. Frankly, I do not know whether it will or not. My observation so far is that the flow charts are extremely interesting and may, over the longer term, be used to a greater extent by businessmen in determining policy. So far, they appear to play a minor role in influencing business policy one way or the other. In the first place, businessmen have not yet developed enough confidence in the information to make proper use of it. Second, businessmen who are participating in an inventory-building boom by shifting their own inventories to their customers' shelves even with proper warning are not inclined to stop and permit their competitors to enjoy increased volume. Once an industry is engaged in this pleasant activity, it is likely to continue until retail shelves are filled, at which time the entire "buying movement" subsides. However, I believe that such a flow chart of activity over the long run will be used more intelligently by business.

The third question was divided into two parts: "What economic policies followed by the government in the past do you consider most open to criticism?" And, "Would better statistical data or research have pointed out beforehand the shortcomings of these policies?" The latter part of this question was apparently not answered. With respect to the first part, the economists were about equally divided, according to their liberal or conservative leanings. What can be said here except that the division of opinion is what might be expected of a sample group of economists and that an advisory board composed of such a group would not be particularly helpful to a policy-making administrator.

The fourth question ("What economic policies would you recommend at this time?") is really a continuation of the third and produces the same division of opinion, illustrating again the dilemma of a public administrator depending upon the economist for proper theoretical guidance. This concludes my comments on the survey of economists.

In his second conclusion the speaker points out some forecasting errors and stresses that additional statistics will not reduce the need for judgment. He supports the view that probable errors are still too great to place complete confidence in forecasting as a basis for developing adequate countercyclical measures to promote economic stability. Certainly this can be said without in any way denying the fact that substantial gains have been made in the way of improved forecasting in the last few decades. New data have been developed and new approaches to the use of data have contributed to progress in forecasting. Furthermore, the many studies of business fluctuations have provided a basis of knowledge without which stabilization policies dealing with inflation, deflation, and unemployment could hardly have been attempted. I am sure we can agree that this progress is likely to continue in the future and that the interest in forecasting will continue as great or even greater than it is today. The more forecasting we do the better we shall do it.

As another point, the speaker makes it clear that while we cannot have complete confidence in economic forecasting to provide an accurate map of economic developments, neither can we depend on automatic snubbers or built-in stabilizers to provide sufficient counteraction when economic events require it. He therefore suggests the President be provided with limited powers to undertake contracyclical action when Congress is not in session. In theory, it is hard to argue this point. However, there are some real hurdles to surmount in reaching this goal.

In the first place, it involves, as the speaker recognizes, the problem of a delegation of powers by Congress. This Congress has not always been willing to do, and it may well involve a substantial political struggle without result. Assuming that the powers would be granted, however, there is then the question of co-ordination of the rather complex governmental administrative structure to get prompt action. Finally, there is the problem of when and what kind of action should be taken. The conflicting advice of economic advisers with respect to action that should have been taken during our recent inventory recession has already been mentioned. If, as a result of this conflict of economic opinion, administrators would have had to form their own opinions on these economic matters whether or not they were equipped to do so, the action taken may or may not be good for the economy.

Finally, practically all of these issues have political overtones. Even with a stand-by committee composed of representatives of both parties the acceptability of any proposed administrative action will invoke great argument. Unless the economic situation is deteriorating to such a degree that all political elements agree on the need for immediate action, there may well be political reverberations which will cause hesitancy and, in fact, postpone action.

As his fifth and last point, the speaker proposes that a counterpart of the President's Council of Economic Advisers should be established by some foundation to provide objective analysis of government plans and projections. Such a group, he believes, would be free from the restrictions which frequently bind those in governmental service.

It may be regretted that the speaker did not include this proposal in his questionnaire to economists so that we might have observed some additional

reactions to this proposal. Perhaps the opinions would have divided about equally in answer to the question on the need for more economic data where a little better than half wanted more data and slightly less than half disagreed or did not care to answer the question. Probably most of us have an insatiable demand for more data and more information and would not, therefore, disagree with any proposal which might provide additional economic information on instability in our economy.

However, I am sure that even an outstanding group of economists working from Olympian heights would have the same problems as economists generally. In the first place, as we have seen, different economists may use the same data and yet arrive at different conclusions. Second, even if unity of approach and conclusion is achieved, the recommendations of the group would probably be characterized as representing either the conservative or liberal school of economic thought and be completely unacceptable to economists of the other school. If its conclusions should be found to be in direct opposition to those of the Council of Economic Advisers, the resulting debates and arguments would add confusion rather than build public confidence in economic research.

Finally, one might wish that an additional recommendation or proposal had been made for developing a broader understanding of the need and importance of economic research both in the political and business field. There is one recent particularly glaring example of how public policy-makers ignore the need for economic data. It was only a short time ago that a Congressional committee decided that such basic economic yardsticks as the various censuses were unnecessary, at least for several more years. And that, in spite of the fact that Congress had undertaken certain responsibilities with respect to economic stability and with the knowledge that there have been great changes in the economy since the last census. To most of us the postponing of the census of manufactures, for example, would have been a catastrophe. Yet it was only through organized effort and the support of many groups that these measures of our economic growth were reinstated.

Moreover, I am sure that the congressmen who voted against the appropriations of funds for this purpose have not changed their minds as to need for the information. This experience can be more or less duplicated by many business economists who are waging a constant fight for a better understanding and appreciation of economic data by businessmen.

It is not surprising, therefore, that all too frequently congressmen and public administrators are not guided by economists, even where good economic research has been done and carefully thought out recommendations are available. Whether it is in the field of business, agricultural policy, labor, or taxes, the ultimate decisions are made by legislative or administrative bodies more responsive to public will and opinion than to sound economic policy.

It is for these reasons, I think, that many business economists experience more frustration in marketing their own product than in finding adequate data. One of the real problems here is the matter of communication. Economists have little difficulty in communicating with each other. But many of us have great difficulty in communicating with the average businessman and with politicians. Part of the difficulty stems from the use of the type of lan-

guage so well described by George Orwell in his admirable essay, "Politics and the English Language." Part comes from the fact that many politicians and businessmen who constitute the market for economic data are even now skeptical of the value of economic research and have little confidence in what economists and statisticians tell them—particularly when different economists tell them different things. Certainly progress has been made in winning the support of businessmen and politicians, but it has been agonizingly slow.

In summary, it may be said that economic research has made it possible to develop a foundation for public policies which can combat the instability in our economy. The economist and economic research are gaining increasing recognition and playing a growing part in providing an analysis of the reasons for instability and prescribing methods of treatment. The influence of economic research for both public and private policy determination is spreading, although at a slow pace. There are important statistical gaps existing today and they should be filled. But what can be done to speed up and broaden the use of the economic data we already have? The prescription here is not easy. Certainly improved communication between the economist and his market will help. In addition, however, if some program either through public or private channels could be organized to broaden the public understanding of the need for and use of economic data and their importance in solving the problem of business instability, it would be most helpful.

ECONOMIC STABILIZATION, FORECASTING, AND THE POLITICAL PROCESS

PROBLEMS OF FORECASTING FOR ECONOMIC STABILIZATION

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I

When the Congress, in the Employment Act of 1946, required the President, in his *Economic Report* to set forth "current and foreseeable trends" in the levels of employment, production, and purchasing power, and the Council of Economic Advisers "to gather timely and authoritative information concerning economic developments and economic trends, both current and prospective . . .," it was evidently their judgment that forecasting could, and should, be employed as a tool of economic stabilization. Yet, there is a fairly common disposition in economic circles to reject forecasting as impossible or too unreliable to be useful in economic stabilization. Indeed, one of the authors of a recent, authoritative symposium on income stabilization reached the conclusion that "in its present stage of development economic forecasting is much too inaccurate to be used as the basis for changes in stabilization measures."[1]

There are good reasons, of which you are all aware, for this pessimistic view of the potentialities of forecasting. But the plain and stubborn fact remains that—I should warn you that this is a main thesis of my paper—there is no escaping the necessity of economic forecasting. Present actions have their effects in the future. If government has any stabilization purpose at all, then in making present decisions as to these actions it inevitably must make frequent, recurrent, and often crucial forecasts. They may be made consciously or unconsciously, scientifically or unscientifically, at one end of Pennsylvania Avenue or the other, but they are still forecasts. There are just two issues, which we hope are not wholly unrelated: (1) how good is the forecasting going to be and (2) how much are economists going to participate in the process?

Before we get down to serious business, let me dispose of two refuges to which economists sometimes flee, especially those who, by virtue of official position, are actually called upon to make forecasts. One is to eschew forecasting as being beyond the competence of any economist,

[1] "The Role of Economic Forecasting in Income Stabilization," by Everett E. Hagen, in Max F. Millikan (ed.), *Income Stabilization for a Developing Democracy*, p. 200.

and when a policy decision or recommendation must nevertheless be made, to assume "no change" in the level of general business activity. This is obviously an implicit forecast, and simply forces the user of the forecast to decide whether or not the assumed "no change" is correct, and if not, to make the necessary adjustments. The other is to make a forecast but to becloud it with a fog of qualifications and ambiguous adjectives of sufficient density to render it largely invulnerable to later attack, but also largely opaque from the viewpoint of those required to make policy decisions. This is another case of passing the buck.

I said a moment ago that forecasting is necessary if government has any stabilization purpose at all. I am assuming throughout this paper that government does have a stabilization purpose and that in fact we want to do an effective job of economic stabilization. The ultimate objective would presumably have two facets: first, the achievement of a long-run growth in national output which does not depart significantly from our capacities for growth, within the limits of voluntary preference for leisure over goods and services, i.e., maximum technological advance coupled with a minimum of involuntary unemployment; and, second, a stable price level, with a gentle upward trend viewed as a not altogether undesirable consequence but not adopted as conscious public policy. Conflict and compromise with other national policy objectives will inevitably preclude full achievement of this goal, but within the limits thus determined, our success in economic stabilization will be measured in important part by the extent to which we are able to make reliable and useful forecasts and to act intelligently on those forecasts.

II

The conventional broad classification of stabilization measures is automatic versus nonautomatic. Automatic stabilization measures presumably require no current forecasting; the forecasting was implicitly done when the law was enacted. The problem relates to their effectiveness. Our system of automatic stabilizers is not symmetrical; not all of the stimulative automatic actions in deflation are matched by corresponding repressive automatic actions in inflation. Moreover, as has often been pointed out, the automatic stabilizers can, at best, mitigate the severity of a decline, and beyond a certain point (e.g., protracted unemployment), their stabilizing effect dwindles toward zero. It is conceivable that a system of automatic stabilizers could be invented which would absolutely stabilize real income, but it would require a rather wide departure from capitalism as we know it. I do not mean

to understate the significance of existing automatic stabilizers. It may well be that they offer a sufficient solution to minor and very short-run fluctuations. But, in the contemporary economic environment, if fluctuations of more than a minor character are still possible—as I believe they are—the automatic stabilizers offer only a partial and limited answer to the problem of economic stabilization.

The nonautomatic stabilizers, however, require conscious decision and positive action. It takes time to recognize and identify an economic development requiring action directed toward stabilization, to determine the appropriate action, and to translate the policy determination into law or regulation—especially if a Congressional enactment is required. A still further time interval ensues between the change in law or regulation and its effect upon incomes, spending, and other economic factors. Such stabilization actions will affect economic behavior usually several months, and often as long as a year or more, after the need for action is recognized. To stabilize effectively, a decision to counteract a decline must be made well in advance of the decline. But this can be done only with forecasting.

It is no solution to the forecasting dilemma to stipulate that stabilization action should be determined by rule of thumb after the fact; e.g., that counterdeflationary measures should be taken after unemployment has risen to a specified percentage of the labor force or that counterinflationary measures should be taken after the BLS index of consumer prices has risen by x per cent for y consecutive months. A forecast is inherently implicit in such a rule of thumb; namely, that recent directions of economic change will continue or at least not be reversed. The tightening of Federal Reserve credit controls early in 1953 is a good example of a delayed action after the fact where the implicit forecast turned out to be considerably in error. The easing of credit policies a few months later, however, is an example of an action which would scarcely have been indicated by an after-the-fact rule and which, therefore, was presumably based on an explicit forecast—a forecast which turned out to be pretty good.

Let me hasten to add that taking action after the fact is usually better than nothing. It will produce an answer which, though probably inadequate and inevitably tardy, is in the right direction more often than not, simply because the momentum of our economy is such that straight, short-run projections of recent tendencies turn out to be right more often than not. Nevertheless, to the extent that anything more than a compensation for past fluctuations is attempted by taking action after the fact, implicit forecasting is involved; it might be called "forecasting by assumed momentum."

III

So far I have argued that forecasting is necessary to successful stabilization without indicating what kind of forecasting I have in mind. Forecasting by a government agency for stabilization policy purposes differs in one important respect from general economic forecasting for private business purposes. In either case, the forecast must be based upon certain initial assumptions as to forces outside the economic system per se, such as war, cold war, or changes in law, or other governmental action. The private forecaster may simply assume no change in government policy on the ground that political forecasting is beyond the competence of the economist, and then leave it to the user of his forecast to make his own assumptions as to changes in government policy and make his own adjustments in the forecast. Or he may make a best guess as to what the political process is likely to bring forth in the way of tax changes, expenditure programs, and the like, and then having stated his assumptions, proceed with a definite forecast. There is nothing inherent in the method to preclude a forecast of another 1929-32.

In the case of a forecast by a stabilization agency, however, government policy is not a completely exogenous variable. The forecasting activity is itself a part of the process of policy determination. A forecast by the Council of Economic Advisers, for example, will normally involve two steps. The first is a preliminary forecast, based on the assumption of no change in private or public policies (or perhaps on the assumption of certain changes which are expected to be made for nonstabilization reasons). This preliminary forecast might well indicate that recessionary tendencies are in prospect. But it cannot stop there. The whole purpose of the forecasting process is to identify those policy changes which are needed to prevent a depression from developing—changes which are needed to make the preliminary forecast become untrue. It must proceed, after identifying these needed changes, to incorporate them into its analysis, to forecast the effects of these changes, and thus to point the way to satisfactory levels of economic activity. Such a forecast is not likely to be a flat prediction of a depression, certainly not another 1929-32. A better term, perhaps, for this kind of a forecast is a "conditional economic projection"—a projection that certain levels of economic activity should prevail on condition that prescribed changes in public policy, and perhaps also certain changes in private policy, are made.

This does not necessarily mean that such a projection by the Council of Economic Advisers must always point to a high level of economic activity or to stable prices. The Council might determine that, as a result of actions taken or not taken in the past, some decline in business activity or some inflation in prices is beyond the effective capacity

of available or conceivably obtainable stabilization measures. I doubt, for example, that any realistic deployment of stabilization measures in 1946-47 could have prevented some inflation. The seeds of inflation were sown long before. Similarly, the seeds of recession may be sown by past failure to control the excesses of the boom. Or the Council's projection might reflect the judgment of government as a whole that other national policy considerations, such as national defense, take priority over stabilization policy and that completely successful stabilization is therefore precluded. But apart from such situations, the "conditional economic projection" should point toward a satisfactory level of production, employment, and purchasing power. This is the mandate of the Employment Act.

I dwell upon this point because I have encountered two attitudes toward the forecasting activities of the Council of Economic Advisers, both of which I believe to be in error. One is the impression, because the Council's projections do point to good levels of economic activity, that the Council is nothing more than a propaganda agency, trying to talk us into prosperity. This attitude arises in part from a lack of candor in the preliminary or initial analysis of economic prospects by the Council. But also, and perhaps more fundamentally, it arises from a failure to recognize the character of this conditional economic projection—that it is not a "cold turkey" forecast, but rather a statement of what should eventuate if appropriate policy changes are made.

The second misimpression is the notion, sometimes subscribed to within the walls of the Council as well as elsewhere, that the requirement for a reasoned but optimistic conditional economic projection, as the end result of the forecasting and policy analysis process, necessarily precludes a frank and forthright statement of the unfavorable aspects of the economic outlook in the course of the analysis. This is admittedly a delicate issue. The Council is presumably an authoritative forecaster. It is authoritative, not only because of the presumed competence of the members of the Council and its staff and because it has approximately full access to all available information, but also because it is a part of the presidency—because it plays an important role in determining what government policy shall be and therefore to some extent is in a position to make its forecasts become true. Because it is thusly authoritative, its pronouncements carry weight in the public mind. The "feedback effect" of a pessimistic analysis therefore could conceivably be considerable. In light of this circumstance, can—or should—the Council be completely frank and forthright in its preliminary analysis?

As I see it, there are two aspects to the answer to this question. First, in spite of the admittedly authoritative character of the Council's forecasts, it is my experience that officials of government typically

exaggerate the public impact of what they say. (Occasionally they underestimate, as in the case of Mr. Wilson's dogs, but this is the exception.) The belief that a frank, preliminary analysis of all factors involved, including unfavorable elements, will necessarily have adverse effects rests on the implicit assumption that businessmen and others who make important economic decisions have little or no knowledge of what is likely to happen beyond that which is told to them by government. This view seriously underestimates the economic literacy of Americans, notably businessmen. They form their judgments on the basis of a variety of economic information, of which government pronouncements are only a part. The feedback effect of a frank analysis, in the business community at least, is a moderate one at most.

Second, it is entirely possible to assess squarely the unfavorable elements in the business outlook in an unsensational and matter-of-fact manner which will minimize any feedback effect. True, if an *Economic Report* were to open with the shocking words, "A serious depression is impending unless drastic action is taken," the feedback effect might be enormous. But a report which calmly and dispassionately analyzes the many facets of the economic outlook, the unfavorable along with the favorable, need not arouse excitement. Indeed, failure to recognize unfavorable elements, which are clearly apparent to others, may well be destructive of public confidence by suggesting that government does not know the economic facts of life and is therefore unprepared to cope with these unfavorable developments. In my judgment, the most confidence-creating course of action is a frank and highly objective preliminary forecast coupled with a policy prescription based on that preliminary forecast adequate to insure realization of our stabilization objectives.

IV

The character of a forecast, or economic projection, is inevitably influenced by the method employed in making the forecast. Forecasting methods based on single or exclusive causes, whether they be sun spots, weather, or changes in the quantity of money in circulation, have now been generally and properly thrown into the discard. So have techniques based on an assumption of rhythm in business fluctuations. One could scarcely have lived through the last twenty-five years and still adhere to the theory that business conditions can be determined by extrapolating one or more sine curves.

Another forecasting technique deserves more attention, if only because it is a technique which apparently is looked upon with some favor in the offices of the present Council of Economic Advisers. This is the technique, developed most thoroughly at the National Bureau of Eco-

nomic Research, of identifying certain economic variables which, in the past, have tended to lead general business fluctuations, and of watching these series closely for signs of an impending turn. Mr. Geoffrey Moore has identified eight such series which, I am sure, are familiar to all of you.

This technique of forecasting has an appeal because of its statistical objectivity, and it unquestionably has certain usefulness, particularly for calling the turn on short-run fluctuations. As a sole or even primary instrument of stabilization planning, however, it suffers from four serious defects which, I am sure, the National Bureau fully recognizes. First, the technique is largely symptomatic. It is heavily dependent upon the assumption that certain structural relationships within the economy will persist into the future. By implication it assumes, for example, that the relationship between commercial and industrial construction contracts awarded to total output is impervious to changes in industrial technology, or that the relationship between so-called "sensitive" prices and prices in general is not affected by shifts in the composition of national output. Second and more important, because it is symptomatic, there is nothing inherent in the forecasting process which throws light on the fundamental operative causes of economic change. The technique itself, therefore, provides no indication of needed remedial action.

Third, by focusing attention on turning points, the lead-and-lag technique may lead the forecaster into paying insufficient attention to the probable level of economic activity. A case in point is the degree of satisfaction with economic prospects expressed in the January, 1954, *Economic Report,* apparently based on indications that no major downturn was probable, in spite of the fact that for several months prior to that time, and since, business activity failed to grow in proportion to increasing productivity and an increasing labor force. And, fourth, it is short-run forecasting. At best, it can predict only a few months into the future. Such short-run forecasting is, of course, highly useful. But the much greater need is for longer run projections which permit a more fundamental diagnosis and a more effective use of long-lead-time stabilization techniques.

A much more useful and promising approach to forecasting for economic stabilization is income and product model building—a technique which can be traced back to 1932, and perhaps even earlier, but which has been practicable only since the expansion by the Department of Commerce in the late thirties of their national income and product accounting series and which has been experimented with on an extensive scale only in the past ten or fifteen years.

The technique is now well understood and rather widely used. Three outstanding recent examples are *Markets after Defense Expansion,*

published by the Department of Commerce, Gerhard Colm's *The American Economy in 1960,* and *Potential Economic Growth of the United States during the Next Decade,* by the staff of the Joint Committee on Economic Report. All three of these studies, incidentally, disclaim being forecasts. To the extent, however, that the projections of demand made in each of these studies are supposed to be realistic and feasible potentialities, given proper public policies, they come close to being forecasts of the type I have in mind.

One important advantage of income and product model building is that it encompasses the entire gamut of economic activity. The method itself requires the forecaster to consider, in as much detail as is practicable and necessary for the purpose, all of the components of the totality of demand. The completeness of the analysis is limited by the sufficiency and accuracy of the raw material, factual and theoretical, which is fed into the model, not by the model technique itself. For the same reason, model building tends to prevent the forecaster from placing undue emphasis on one particular variable. The mere act of listing all of the components of gross national expenditure and assigning reasonable values to them subdues the temptation to select one dramatic one, such as residential construction or military expenditures, and attach exaggerated significance to it.

A related advantage of income and product model building is that the technique requires the projection not only of demand for total national output but also of potential supply at given levels of employment. It forces the forecaster to recognize and make allowance for the effects of growth in the labor force, increasing labor productivity, changes in the labor participation rate, the average work week, etc. Failure to do this can easily lead, for example, to complacent conclusions to the effect that 1954 is "our second best year," which it definitely is not when measured in terms of potential output. This is a particularly relevant consideration as regards forecasting by the Council of Economic Advisers. The Employment Act requires the President to set forth levels of production, employment, and purchasing power needed to carry out the policy of the Act; that is, realizable output goals against which performance can be measured. The *Economic Report* of last January failed to define these goals. Such goals, whether they be maxima or minima, optimistic or pessimistic, are an essential element in income and product model building.

Perhaps the most important advantage of income and product model building is that it integrates aggregative economic theory and the forecasting calculation. Economic analysis becomes a part of the forecasting process and not supplemental to it. In essence, model building is translating macroeconomic theoretical concepts into numbers, past and prospective. Theoretical concepts as to functional relationships, such as

the relationship between income and saving or between growth in real disposable personal income and business investment expenditures, can be put into appropriate combinations of numbers in the model. Moreover, prospective changes in these functional relationships can be reflected in the model. They are not necessarily assumed to be fixed, as in the case of the leads-and-lags approach.

Model building, however, also has its disadvantages and limitations. One disadvantage—which is not inherent in the method but which is usually present in actual application—is a temptation to focus on highly aggregated magnitudes at the expense of detail. This disadvantage, I think, has been a more real one to the econometricians who have attempted to reduce the relationships involved in the model to a finite system of equations of manageable proportions than it has been to those who use the nonmathematical or quasi-mathematical approach to model building, where a much larger number of variables can be handled in an approximate, if nonalgebraic and inexact, fashion.

A second disadvantage in model building—which again is not inherent but which I believe is usually present—is some tendency toward a pessimistic bias. Projections of demand include demand for those already existing goods and services which can be estimated from data on consumer stocks, sales, apparent trends in consumer habits, etc. But they also include the demand for the new and the unknown. It is easy to see and predict the decline of the old but is extraordinarily difficult to foresee the rise of the new.

A third practical difficulty is that the process is inevitably slow and laborious, and it is scarcely a one-man job. The voluminous data required for a well-reasoned projection are slow in becoming available. The time required to analyze the data and all of the major interrelationships involved and to revise preliminary assumptions and subsequent calculations is considerable. The slowness of the technique, on the other hand, is in some respects an advantage. It prompts the analyst to concentrate on fundamental changes in economic activity rather than on the most recent wiggle in this or that curve. What is lost in the way of currency of forecast of very short-run fluctuations may well be more than compensated for by less ephemeral and more thorough analysis of the intermediate and longer run fluctuations which constitute the important economic stabilization challenge.

V

This leads me to the second main thesis of my paper, as follows: Forecasting techniques have advanced to the point where they are beginning to provide a reasonably reliable basis for economic stabilization policy making. I believe that much of the pessimism regarding the potentialities of forecasting, to which I referred earlier, is exaggerated

or outdated. I am not suggesting that we have the problem solved, or that anything resembling perfect forecasting is possible. Rather, I am suggesting that it is possible to develop income and product models which, supplemented by leads-and-lags and perhaps other analyses, show the general direction of economic change, its approximate though not exact timing, and at least a rough gauge of the magnitude of that change. And I am suggesting, further, that such projections provide a sounder basis for stabilization policy making than do intuitive judgment, extrapolation of the *status quo*, or action after the fact. Let me indicate briefly some of my reasons for this cautiously optimistic view of forecasting.

First, it hardly needs to be said that great progress has been made toward a better understanding of the process of economic change in the last two decades. This is not mere breast-beating on behalf of the economics profession. A healthy scientific skepticism toward our profession is all to the good, and we should remind ourselves frequently of past failures of economic analysis, especially of those of the late twenties. But skepticism and self-abnegation can be carried too far. It is a plain fact that economic science has made great strides in the past twenty years or so. Thanks largely to the revolution in economic thinking touched off by the depression and by the *General Theory*, we have added enormously to our supply of tools of economic analysis. We are in a much stronger position to attack and solve economic problems than we were a short generation ago.

Second, one of the main exogenous variables of former years is no longer so unpredictable: government policies affecting economic activity. This may be attributed partly to the commitment of the Employment Act, but it is also due to the clearly evident increase in economic understanding on the part of responsible officials of the government--notably members of the Congress.

Third, the adequacy of data needed for forecasting is gradually improving. Although much remains to be done, recent years have witnessed a steady improvement in the quantity, quality, and timeliness of economic statistics. The series on manufacturers' new orders deserve special mention in this regard. And beyond this general improvement, one statistical innovation of great signifiance has been made: the application of scientific sampling techniques to the analysis of intentions to spend, such as the Commerce-SEC and McGraw-Hill surveys of business investment anticipations and the consumer surveys conducted by the Michigan Survey Research Center for the Federal Reserve and certain private organizations.

These surveys are relatively new. They suffer from certain inherent sources of error, including: the fact that many respondents, even large corporations, frequently make only very tentative plans as to future

actions; and individual responses inevitably involve an implicit forecast as to general economic developments, which may prove to be wrong. The surveys have not been tested by a major decline in business activity. Nor has enough work yet been done to develop them to their maximum usefulness. Experience to date, however, is encouraging. The Commerce-SEC projections of total expenditures for new plant and equipment have corresponded closely with actuals, both as to direction of change and magnitude, in every year except 1950, and the industry-by-industry projections have been accurate as to direction of change in a high percentage of instances. (See Louis J. Paradiso's paper on "Economic Projections by the U.S. Department of Commerce," scheduled for publication in the *Proceedings* of the American Statistical Association meetings of September, 1954.) The Michigan surveys of consumer attitudes toward purchases of durable goods have accurately predicted direction of change and have not been too far off as to magnitude. (See, for example, Rensis Likert's statement in *Hearings* before the Subcommittee on Economic Statistics of the Joint Committee on the Economic Report, July, 1954, pages 288-295.)

As experience with these surveys increases, it should be possible to improve them further and to develop improved techniques for compensating for inherent sources of error particularly if better information can be obtained as to the character of implicit forecasts and as to degree of intention; i.e., the firmness of the planned expenditure. Some progress along these lines has already been made.

If I may continue to digress for a moment, I would like to mention briefly two other improvements in data which would make a further contribution to our ability to forecast. One of these would be the regular publication by the Department of Commerce of quarterly, seasonally adjusted estimates of gross national income broken down on an after-tax, after-transfer basis which would be comparable with our present so-called "gross national product" series. What I have in mind in this regard is the kind of arrangement of data which used to be published semiannually by the Council of Economic Advisers under the title, "The Nation's Economic Accounts." In spite of statistical imperfections, this tabulation is an extremely useful analytical tool. Unfortunately, it now survives only in occasional publications of the Joint Committee on the Economic Report, in a vestigial annual appendix table in the *Economic Report of the President,* in a chart with no numbers attached in *Economic Indicators,* and in Gerhard Colm's work at the National Planning Association.

Second, we need better information for measuring and projecting changes in the economy's productive potential. We need quarterly series showing man-hours worked in total and in the nonfarm private, the agricultural, and the civilian government sectors of the economy. And

we need more comprehensive and accessible measurements of productivity and more research into the causes of productivity increase.

There is one facet of the productive potential about which my own thinking is not yet clear and which there is not time to develop in this paper. Three years ago the Paley Commission focused our attention on the proposition that the real unit costs of the material and energy inputs into the American productive process may have finally emerged from their secular decline and may now be predominately on the increase. Ever since then, I have had the uneasy feeling that our rather facile projections of past trends in real output per man-hour—particularly the longer run projections—do not give adequate consideration to this possibility.

My fourth and final reason for optimism—to return to the main stream of my argument—is the impression, which I cannot prove, that by the pragmatic test forecasting has fared much better in recent years than it did some years ago. The projections of the Council of Economic Advisers, though frequently ambiguous and hedged about, have been essentially accurate, save only for the misfire of January, 1949. The projections following the Korean invasion were generally good, in spite of the complications injected by strong psychological factors ("Is This World War III?") and in spite of exaggerated estimates by the military as to anticipated levels of defense expenditures. The model builders, almost unanimously, forecast the current—or should I say recent—recession, at least as to timing and, with a good deal of trepidatory hedging, as to magnitude also.

In spite of this improved record, there is still widespread reluctance to bring models out into the open. There have been a few exceptions—notably the reports of the staff of the Joint Committee on the Economic Report under Grover Ensley's direction. The Congressional members of the Joint Committee deserve commendation for encouraging these studies. But these are exceptions. In the main, there is still an air of black magic about the business of forecasting. The time has come, I believe, for serious and responsible forecasters, especially those in authoritative positions, to open their books to the public, to state specifically their assumptions as to exogenous factors, to describe fully the techniques and logic by which estimates are calculated, and to develop preliminary projections in the form of quantitative models. But I would like to emphasize again that in forecasting for economic stabilization purposes, the number work is only the beginning of the process. More than mathematics, whether it be higher or lower mathematics, is required in forecasting for economic stabilization. The important part of the job is the application of judgment and understanding of both economic process and political process to the identification of those changes in economic policy, private and public, which will lead to high employment and stable economic growth.

POLITICAL ELEMENTS IN FULL EMPLOYMENT POLICY

By Stephen K. Bailey
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Earlier in this century, a distinguished economist wrote a book the last chapter of which was entitled, "If I Were Dictator." It was a glowing account of what economic measures would save society if only politicians were not around to louse things up.

My theme today is built around the dismal forecast, now widely shared by most economists, that politicians are likely to be around for some time to come. Let me hasten to add, however, that there are stabilizing factors at work and that the secular trend is bullish, although the rate of development may not be great enough to guarantee in the short run the maximum utilization of all the resources of the American Economic Association and the American Political Science Association.

It is ten years, almost to the day, since a group of economists, political scientists, and politicians sat around a table on Capitol Hill and drafted a so-called "Full Employment Bill." In the eyes of history, this temporary confluence of professions may have been of more importance than the Employment Act itself. For one of the central problems before both economists and political scientists is how to make politicians as smart as we are and (if I may be pardoned a heresy) vice versa. This is what Lord Macaulay had in mind when, referring to currency reform in the reign of William II, he said: "It would be interesting to see how the pure gold of scientific truth found by the two philosophers was mingled by the two statesmen with just that quantity of alloy which was necessary for the working."[1]

The problem is not new. What is new is the degree of our own self-consciousness that an interdependency exists. One of the salutary results of the Employment Act has been the forcing together of professional economists and professional politicians on a scale hitherto unknown in this country. In Mr. Nourse's felicitous expression, "the research division, the engineering division, and the sales division," have been constrained to sit down together. Even if Mr. Nourse himself found this confluence at times an unhappy one, he has enormously increased our sum of knowledge about the pitfalls of this necessary collaboration.

I do not wish to attempt a detailed summary of the obvious. You are more fully aware than I of the political elements in full employment policy. In fact, some of the most sophisticated writing in this field has been done by economists. I need only refer to the writings of Mr.

[1] Quoted in C. H. Hankin, *The Mental Limitations of the Expert* (India: Butterworth & Co., Ltd., 1921), p. 27.

Blough and Mr. Nourse to make my point. They, and others, have listed the tough ones.

But purely as a preliminary catechism, let me recapitulate a few major points:

1. America is a vast and highly pluralistic society. There is no hand, seen or unseen, which is capable of homogenizing all of the diverse political and regional appetites of our country into a uniform, Grade A public interest. This frequently leads to shifting compromises and "second bests" in economic as in most other policies.

2. Full employment in a free society is an aggregate concept. The constituent pressures on a congressman are often highly "unaggregate."

3. Politicians, like some other people who shall remain nameless, occasionally differ on the subject of what policies actually will produce a condition of full employment. The difference between politicians and others in this respect is that if politicians guess wrong, they run the risk of losing their jobs. They have a tendency, therefore, to do a very cowardly thing: they hedge.

4. There is in America a tradition of what Burt Marshall has called "serendipity." Serendip is an ancient term for Ceylon. Mythology recalls that there were once three princes of Serendip. In Mr. Marshall's words, these three princes were "special favorites of benign fortune. Things never worked out as the princes planned them, but they always worked out remarkably well, nevertheless, and the princes went through life blessed with unintended and unforeseen happy consequences."[2] The principle of serendipity accounts for whatever truth there is in Grover Ensley's claim that, on the whole, Congressional action in the economic field during the past ten years has been sounder than the advice of economic experts. Serendipity makes some congressmen smug —more smug, perhaps, than is warranted by an uncertain future.

5. The phrase "full employment policy" seems to imply a consistent and co-ordinated federal effort. That co-ordination is made remarkably difficult by the extraordinary jogs in Pennsylvania Avenue from 17th Street, N.W., to 2nd Street, S.E. Twists of institutional jealousies and prerogatives in the tax and appropriations lanes alone make driving hazardous and destinations uncertain.

6. Even within the Executive Branch, Departments like Agriculture, Labor, Commerce, Interior, Treasury, and the Veterans Administration do not always see eye to eye with each other—or with the President. And there is of course the problem of independent and quasi-independent agencies like the Federal Trade Commission, the Interstate Commerce Commission, the Federal Reserve, and Mr. Wright Patman.

7. Even within the Executive Office of the President, there is no

[2] Charles Burton Marshall, *The Limits of Foreign Policy* (Henry Holt & Co., 1951), p. 46.

assurance that all those who should, actually will meet together in the lobby of the Sherman Adams Hotel.

8. State and local governments make decisions about spending and investment on the basis of political considerations frequently ignored by department heads and presidential advisers in Washington. I happened to be Mayor of Middletown, Connecticut, when Mr. Humphrey, with the help of some friends in the Federal Reserve, slammed on the brakes in the spring of 1953. Fortunately for Middletown (and perhaps for Mr. Humphrey and the United States), his foot slipped. We would have built the schools anyway, but an interest rate of 1.90 is a lot easier on the books and the ballots than 3.25. And never underestimate the power of local officials. Representative Seeley-Brown is a Republican and I am a Democrat, but I called him Seeley and he called me Steve.

9. State and national elections come periodically. It is becoming increasingly obvious that a "healthy readjustment" is easier in odd years than in even.

10. Finally, the apocalyptic spectrum known as international relations is in the hands of politicians, here and abroad. Full employment policy is mightily conditioned by international events, even if the reverse is also true.

These are some of the major political variables which stand between the scientific economist and consistent economic policy. They are what I would call the centrifugal forces in our government. The search of both economists and political scientists in the past two decades has been for countervailing, centripetal forces which might increase the rationality of decision making in the field of economic policy. We have a long way to go, but I think we ought to count our blessings. Progress has been made, and the progress is impressive.

The first centripetal force has been in the field of economics itself. Through brilliant analytical work, the economics profession has narrowed its own areas of disagreement. There are few economists left, for example, who would argue for a tax rise in a major depression, as Roosevelt did. The crystallizing orthodoxies of the economics profession make their way into both branches of the federal government, and after a slight delay have an enormous impact upon policies. As Lord Keynes wrote so brilliantly:[8]

> The ideas of economists and political philosophers, both when they are right and when they are wrong, are more powerful than is commonly understood. Indeed the world is ruled by little else. Practical men, who believe themselves to be quite exempt from any intellectual influences, are usually slaves of some defunct economist. Madmen in authority, who hear voices in the air, are distilling their frenzy from some academic scribbler of a few years back. I am sure that the power of vested interests is vastly exaggerated compared with the gradual encroachment of ideas.

[8] J. M. Keynes, *General Theory of Employment, Interest, and Money* (London: Macmillian & Co., Ltd., 1936), pp. 383-384.

There has been a heartening increase in agreement among the members of the Joint Committee on the Economic Report during the past six years, and I submit that this increase would have been impossible without the establishment of prior agreement within the economics profession itself.

The second centripetal force has been at the level of executive organization. The tentative, and almost accidental, character of Executive Branch interest in problems of economic stabilization forty years ago is reflected in a letter written to President Wilson by his Secretary of Commerce dated May 7, 1913. The letter reads as follows:[4]

> Sir: There is much practical wisdom in the suggestion made by you to Secretary McAdoo yesterday, respecting the advancement of public works under present conditions, that I venture to add a word in the same line.
>
> The point of attack in the matter will not be with the executive departments. These, inspired by you, will act quickly when authorizations and appropriations allow. It is the chairmen of the two appropriations committees who control the situation. I would suggest a conference, at early convenience with these chairmen and with Mr. Underwood, and others if you prefer, to point out to them the practical value to us now (not at a future date, but today) of such appropriations as will permit the progress during this summer and fall of contract work as fully as possible.
>
> The Department of Commerce has asked appropriations for lighthouse and other work already authorized, aggregating something over a million dollars, at many different points. They are no more needed than other public works, but they would add to employment and the distribution of funds, and if appropriations were deferred to the next session of Congress a year would be lost, during which much might happen. Practical common sense would seem to indicate the wisdom not only of appropriations for needed public works, but the political expediency of having those appropriations quickly, for the reason so cogently stated by the Secretary of Labor yesterday.
>
> Respectfully,

In regard to Executive-Legislative relationships, this letter is as hot as tomorrow's headlines. Many of the problems it raises are still unanswered. But there have been major changes in the institutional mechanisms for apprising the President of what he can or should do. The great landmarks in this development have been, of course: the Budget and Accounting Act of 1921; the Reorganization Acts of 1939, which established the Executive Office of the President; the Employment Act of 1946; the National Security Act of 1947; and the subsequent administrative additions and changes which have been made within the Executive Office framework itself. The Executive departments and agencies still ride off in a variety of directions; strategic and tactical moves in relation to Congress are still handled gauchely at times; but the clearance and advisory mechanisms in the Executive Office have markedly increased the chances that policy free-wheeling will be a matter of political choice not of staff default. And these mechanisms are constantly being refined. The reconstitution of the Council of Economic Advisers in 1953, for example, established an Advisory Board on Economic Growth and Stability under the chairmanship of Arthur Burns.

[4] Letter from William C. Redfield, Central Records of the Department of Labor in the National Archives, 16:71.

This interdepartmental board includes representatives, at the under or assistant secretary level, of Treasury, Agriculture, Commerce, and Labor. It also includes a member of the Board of Governors of the Federal Reserve System, the Assistant Director of the Bureau of the Budget, and Dr. Gabriel Hauge of the White House staff. There is no necessary magic in interdepartmental committees. Washington probably suffers from too many of them. But in this particular case, an interdepartmental advisory committee may be an extremely useful educational and policy co-ordinating device.

A third series of centripetal forces have developed in Congress and in the structure of political parties. The Legislative Reorganization Act of 1946 was not an unmixed blessing in this regard, but it did result in the establishment of Majority and Minority Party Policy Committees in the Senate, it did cut down on the number of standing committees, and it did focus attention on the problem of diffusion in Congressional activity. The very existence of the Joint Committee on the Economic Report and the Joint Committee on Internal Revenue Taxation with their respective staffs indicates that Congress is aware of the need for a more unified appraisal of fiscal and economic programs.

Both Republican and Democratic National Committees have increased their research services to Congress and have sincerely tried to find common denominators of agreement on economic issues within their respective parties.

Regularized channels of communication between the President and the Congress have increased in quality and quantity during the past two decades. I refer not only to the care now taken in the preparation of the three annual presidential messages—on the "State of the Union," the budget, and the *Economic Report*—but to the new liaison status given to the Vice President, the weekly meetings between the President and his Congressional leaders, and the more systematic use of department heads in defending the President's program before the Congress.

These are all encouraging signs. But, unfortunately, centripetal mechanisms, no matter how carefully they are designed, are not enough. As J. S. Mill once said: "In politics, as in mechanics, the power which is to keep the engine going must be sought for outside the machinery." In the final analysis, economic stabilization like any other policy goal depends upon the system of value priorities and the political skills of those who wield political power. No matter where we turn in government we find that economic goals are conditional. Man does not live by bread alone. The goals of physical survival and of freedom itself are not necessarily in conflict with, but they are certainly antecedent to and higher on the value ladder than any circumscribed economic goal—no matter how desirable. To get at these value interrelationships we need

a lot more than a Council of Economic Advisers or a Joint Economic Committee. We need political leadership at both ends of Pennsylvania Avenue—leadership which is capable of performing the highest task of statesmanship: the mobilizing of power behind articulated goals. In the kind of governmental system we have in America, this is an extraordinarily difficult assignment. Lines of responsibility and accountability are not clear cut. The vast and frequently competing congeries of power represented by interest groups in our society are not easily moralized or even contained. The shifting sands of public opinion and the swiftness of changing events make the very task of goal setting and political implementation extremely hazardous. And yet the mobilization and harnessing of political power is the only master key to the development of consistent programing in the economic or any other field.

This puts an extraordinary burden upon the President of the United States. Mr. Truman realized this when, without prophetic insight as to his successor, he stated that the President's desk is like a general's. Truman outlined what he called the five vital steps of strategy: (1) estimate your own resources; (2) estimate your enemy's resources; (3) form a judgment as to what is to be done; (4) implement that judgment with a plan; and (5) persuade your leaders of the value of that plan, and mass your forces for the attack.

This is almost a perfect description of what most presidents have not done or have done badly. Presidential leadership means what human leadership has always meant: taking account of multiple forces and interests in a more subtle and forceful way than traditional, formal procedures generally permit. Possibly the greatest single weakness of the present administration is its faith that institutional arrangements, secretariats, and rationalized divisions of labor in the Executive Branch are by themselves adequate to deal with the complex and diverse value configurations of our national polity. The setting and dramatizing of goals, especially in the economic field, have been intermittent, often contradictory, and almost casual. It was not until the exigencies of a political campaign forced the issue that the President was willing to set economic goals for longer than a month or two in advance. I only hope and trust that this reluctance to perform the highest function of presidential leadership was not due to staff suggestions that because forecasting is not economically "scientific" the President should ignore his prophetic role. If this were the case, it only lends fuel to the fire of my own conviction that untainted, professional, scientific economists belong back in a dark corner of the Budget Bureau, not at the level of direct advice to the President. However hard it may be on the egos of some economists, the Council of Economic Advisers was not set up to please the American Economic Association. The Employment Act is

quite clear about the policy functions of the Council. The Act states explicitly that each member of the Council shall be a person who, and I quote, "as a result of his training, experience, and attainments, is exceptionally qualified to analyze and interpret economic developments, appraise programs and activities of the government in the light of the policy declared in Section 2, and *to formulate and recommend national economic policy* to promote employment, production and purchasing power. . . ." (Italics supplied.)

The Council, in short, was established to help the President perform his goal setting function, to help him as a sorter of values, and to help him in his role as a mobilizer of political power. This makes the Council, inevitably, a participant in the political process, not an adjunct thereto. The Act implies that members of the Council should be something more than economists, that they should be in tune with the value premises of the President, and that like the President they should be politically expendable with changes in administration.

I am aware that this is a controversial subject among economists—and that I am taking an unpopular position. But I must as a political scientist state my position with some emphasis. I do not believe that economists have any right to participate in high policy making without running the risks of political involvement and political compromise. Those who will not play unless they are guaranteed immunity against politically-tailored value commitments remind me of the early Fabian socialist, Joseph Burgess, who refused to compromise on some issue during a general election and thereby lost his seat in Parliament. George Bernard Shaw complained bitterly as follows:[5]

> When I think of my own unfortunate character, smirched with compromise, rotted with opportunism, mildewed by expediency . . ., putrified by permeation . . . I do think Joe might have put up with just a speck or two on those white robes of his for the sake of the millions of poor devils who cannot afford any character at all because they have no friend in Parliament. Oh these moral dandies, these spiritual toffs, these superior persons. Who is Joe anyhow that he should not risk his soul occasionally like the rest of us?

If an economist wishes to limit his activities to objective economic analysis, he has a perfect right to do so; but that right should be exercised about three steps or three blocks removed from the President. What some economists call the "scientific" function is an indispensable function in modern government, but it is a totally different function than that prescribed for the Council of Economic Advisers by the Employment Act. If the Employment Act had established the Council as a Supreme Court of Economic Truth, it would have created an administrative monstrosity. The Presidency creates a magnetic field which structures everything it touches with the electricity of politics. An economist has no option. He must either escape the field completely,

[5] Hesketh Pearson, *G.B.S.* (Harper & Bros., 1942), p. 156.

or he must be drawn into the magnetic orbit. The economics profession cannot have it both ways. It cannot claim political immunity for Mr. Burns and at the same time ignore the fact that he made a major public speech in Detroit, Michigan, two weeks before a national election.

With all due respect to Mr. Nourse, the tortured early history of the Council was in part his own making. He attempted to make the Council into something it was never intended to be and, at its peculiar level, never can be: an oasis of pure economic science. Mr. Burns, with rare and notable deviations, has doubled in spades. This perspective has tended to make the Steelmans and the Hauges, the Snyders and the Humphreys the true economic advisers to the President and has stringently limited the Council as a true policy arm of the Chief Executive. Mr. Keyserling may have carried the logic of his own position and personality to unnecessary extremes, but this was in part an understandable reaction to the sincere but pristine myopia of his distinguished predecessor.

The present sorry and bitter hiatus between the Council and the Joint Committee is more than a matter of personalities. It is a direct outcome of a misreading of the proper role of the Council. There may be good tactical reasons for keeping the Council away from public hearings before Congressional committees, but there is every reason in the world to keep constant and friendly informal contacts rolling between the Council and the Joint Committee. There is every reason, that is, if both the Council and the Joint Committee are policy-oriented. If the Council is not policy-oriented—if it conceives of its chief function as that of adding up freight car loadings to give the President a Monday morning statistical summary of current indices and short-run projections —the Joint Committee is inevitably left high and dry as a potential weapon of presidential influence in the field of economic policy.

Goal setting, although the supreme task of a President, is not worth much unless there is political follow-through. In the economic field, unless the Council helps—at least covertly—in this follow-through, the President must depend upon *ad hoc* expedients which lack both the strength of considered strategy and the ideological force of economic sophistication. A little recent history is perhaps germane at this point.

In November, 1947, the Council of Economic Advisers reported to the President and the Cabinet that the then inflationary dangers were serious to both the short-run and the long-run stability of the economy and suggested a ten-point legislative program to handle the situation. The ten-point program was submitted to a special session of the Eightieth Congress with neither proper bill drafts nor Executive Branch clearance on testimony to back it up. As far as I can judge from a study

of the records, there was not even a suggestion of strategic thinking about pressure groups and Congressional support. In January, 1948, the President reiterated this demand for anti-inflation legislation in his "State of the Union" message. Again there was no conscious strategic planning in the Executive Office or elsewhere for the active mobilization of a working coalition to get results. In the summer of 1948, President Truman called a special session of Congress and again submitted an anti-inflation program. Virtually the only concession to strategic thinking this time was a hurried call to Paul Porter to testify, after a superficial briefing, before a Congressional committee on behalf of the President's program.

After the November elections and in preparation for the Eighty-first Congress, the President appointed Dr. Nourse, then chairman of the Council of Economic Advisers, as head of an *ad hoc* cabinet committee to work out an omnibus economic stabilization bill. In January, 1949, after much of the technical preparatory work had been finished, Secretary of Agriculture Charles Brannan took on the job of developing agency and Congressional support for the bill. Here, after fifteen months of virtual futility, was the first serious attempt to look at the economic stabilization program in terms of building effective consent behind it. But even here, the strategic planning was pitifully inadequate.

All this adds up to the fact that the development of a consistent economic policy in the federal government cannot even be approximated without the central formulation of a political program and the mobilization of a successful coalition of power to carry the program through.

I cannot conclude without pointing out that presidential leadership —even with the aid of a policy-oriented Council—is only one facet of this problem. Congress must respond with a more consistent power focus than it has developed up to now. That focus can never be as clear as the President's, for the kaleidoscopic representative function of the Congress interferes—and probably should interfere. But the tolerances for programmatic anarchy should, in my estimation, be narrowed. Insofar as the force of ideas is important here, the Joint Economic Committee even now performs a significant function; although that function could be strengthened if a more sophisticated provision were made for a "legislative clearance" liaison between the members and the staff of the Joint Committee on the one hand and the members and staffs of the standing committees dealing with major economic legislation on the other. It is possible that a joint economic-budget committee, as suggested by Mr. Colm, might help in the development of more consistent economic policies; although, if the Congress went that far, I think that I should prefer a joint committee on the state of the

union which might operate each year for not longer than three weeks and whose sole job it would be to hear testimony on the interrelationships of the three presidential messages.

But again, the real key here is not minor institutional changes to help spread the cold light of reason. The Spanish writer, Unanumo, thinking of Goethe's dying words, "Light, light, more light," declared passionately, "No, warmth, warmth, more warmth; for we die of cold not of darkness. It is not the night that kills but the frost."

The great job of the Congress and of our political parties is to build responsible communities of interest around the major value goals of our society—not to reflect but to refract and moralize the divisive pressures in our democracy. Whoever, through personal leadership or through refining the administrative and political instruments of government, is able to develop more cohesive and responsible power behind more coherent and intelligently constructed programs will have solved the key political elements in full employment policy.

DISCUSSION

Solomon Barkin: Both papers reinforce the demand that the Council of Economic Advisers abandon its aloofness and assume direct responsibility for making economic forecasts for the short run and evaluations of the adequacies of our short-run and long-run economic performance in terms of the primary objectives of the Employment Act of 1946. The Council was created to help realize a high-employment economy. Its members must help the Chief Executive formulate policies to attain this goal. Despite the determination of both the Council and the President of the United States to avoid the test implicit in the Act, the very exigencies of our political life compelled their acceptance during the last few weeks of the political campaign. They abandoned comparisons between current and past performance and admitted that the real measure of our economy is its ability to realize the full potential of growth and utilization of man and resources. This turn gave many of us confidence that our national government will more conscientiously seek both economic stabilization and growth.

Economists, both in and out of government, must undertake to make forecasts of future developments, analyze the implications of current economic institutions, and elaborate on the effects of alternative policies or plans. Their occupation involves the organization of past economic events into orderly patterns which suggest a sequence of occurrences, a time relationship, and a series of effects. Seeking to understand the past and the present, they cannot reject the responsibility for forecasting and projecting the future, for they will then be denying the utility of their knowledge and the continuum of human affairs within the area of their competence. Neither of these positions can be stoutly defended by economists serving active economic or public agencies. Their responsibility is to provide their principals with the insight and knowledge, no matter how carefully they define their assumptions and express the limitations of their own efforts.

The economist must concern himself with short-run, intermediate, and long-run forecasts. The objectives are stability and growth at all times and throughout an entire period. To minimize the short run is to overlook the political implications of temporary periods of distress or the disaster which may befall us in the long run from short-run reverses. Professor Turner properly adds his voice to the many who have cautioned against mechanical techniques for forecasting. However scholarly the source or the auspices, one must be suspicious of the results. They have proven treacherous at critical points. The techniques overlook the familiar observation that however similar the future is to the past, it is necessarily different. Structural and institutional changes are constantly occurring to alter performances. Governmental and political factors make obsolete older relationships. Laws are passed and institutions are created to change the old, so that new conditions will be born. The past, therefore, is a defective guide for the future.

The lag-and-lead technique for economic forecasting is built upon such past performance. It may be helpful in signaling short-run economic turns,

but it cannot be used to predict the length or intensity of cycles. In the hands of the astute student of economic developments it is useful for analyzing economic events. The trade-union economist must include them in his battery for study, because he must be able to preceive the downturn long before it is evident to the community at large. His responsibility is to alert trade-union leaders and the government to the need for corrective action.

The defects of the mathematical projection are made evident by a study of the shortcomings of a commonly used procedure for forecasting economic trends in the textile industry. It is assumed by some textile economists that the two-year cycle of textile activity is still characteristic. But in fact, significant changes in inventory practices of apparel manufacturers and retailers and the lively competition among apparel items resulting from the revolutionary changes in our clothing habits have reduced the influence of this inventory factor. In this era of innovation, past relationships are being strikingly modified. Management itself is more keen about and anxious to introduce new production methods and final products. Suburban communities and the new patterns of living flowing from full employment and higher living standards are changing the propensities for consumption of different types of goods. Mechanical projections of prewar or early postwar experiences are likely to lead to deceptive results.

The increased use of the projection technique is to be applauded, but it should not be described as a forecasting tool. It is primarily an analytical procedure for examining the implications of current institutions, usually for some point in the future, and for spelling out the probable effects of specific policies. It is most useful for studying the steps necessary to realize such specific goals as are spelt out in the Employment Act of 1946 and to examine the practicability and feasibility of individual programs. The statement that our defense program had to be reduced because our economy could not carry the load was proved unsound by this type of analysis. A full employment economy may be realized by a number of courses, such as high labor income, high capital expenditure, or a large governmental program. Which course should we adopt and what are the practical challenges and institutional changes necessary for the realization of each of these alternatives? Light on the analysis of these questions is shed by the projection technique.

We are abundantly provided with social goals and national values. In addition to the objectives spelt out by the Employment Act of 1946, we have inherited many from our recent history. The thirties left us with an inheritance of widespread sensitivity to our national well-being. Adequate national and allied defense is a continuing goal. In addition, groups are agitating for specific targets, such as better schools, medical facilities, roads, and other vital services. The trade-union movement is considering the possibility of a shorter work week. All these must be examined in the light of their effect on our economy. The model technique is particularly well suited to such investigations.

Many employing the forecasting technique have specific short-run and immediate business or local interests. They are concerned, not only with the performance of the American economy as a whole, the shortcomings of its

over-all attainments, and the need for general stabilization programs, but also with the impact on specific industries, areas and population groups. Unfortunately, the men making long-run projections of economic events have made few sallies upon the task of spelling out the specific effects of national economic growth upon the component industries or services. Studies on the effects on specific geographical regions have also been limited. As a result, the projection technique is unable to provide us as yet with the material for the full attainment of stabilization and growth.

We are currently witnessing the secular contraction of such large industries as coal, leather, and textiles, which have suffered in the midst of high national economic activity. The preoccupation with global figures has minimized specific concern for these groups. Even when the Council of Economic Advisers and the Joint Committee on the Economic Report were moved to interest themselves in these problems, they were distant and half-hearted. Yet, can one consider our stabilization authorities to have fully discharged their responsibilities unless they have similarly concerned themselves with the well-being of the individual sectors? They have committed the error of forecasting "by assumed momentum," which has proved false and misleading in connection with all three areas. We have not experienced any long-term recovery in any of them. Moreover, the decline of these industries has created serious economic problems for the textile areas of the eastern seacoast, the mining areas of the middle states, and the leather centers. Global studies must be joined with investigations of specific sore spots if stabilization is to be fully realized.

Howard R. Bowen: At the outset I should like to pay my respects to our speakers for introducing into the lexicon of economics two useful new terms. I refer to Mr. Bailey's "serendipity" and to Mr. Turner's "forecasting by assumed momentum." Serendipity, I take it, is a twentieth-century version of the "invisible hand," and "forecasting by assumed momentum" suggests the wisdom of Ecclesiastes: "The things that hath been, it is that which shall be; and that which is done is that which shall be done: and there is no new thing under the sun."

I am sure that our speakers are well aware that the positions they have taken are highly controversial. Perhaps they planned it that way. At least, each paper has aroused in me a lively spirit of dissent. First, let me take up Mr. Bailey's paper.

His general position, as I understand it, is that America should have a comprehensive national economic policy that is consistent with our basic values; that this policy should be formulated in the Executive Office of the President; and that this policy should be put into effect by means of a political program under the leadership of the President. With this much I am in agreement. But then, Mr. Bailey implies, the Council of Economic Advisers is to be a principal instrument by which all of this is to be done. Specifically, he implies that the Council should be not only a formulator of economic policy but also an active agent in seeking adoption of that policy by Congress. Here I find myself in disagreement. I think that the Council—at least if it is to consist

of economists—cannot, and should not, assume such responsibility. Professional economists are not suited to perform an essentially political task. If they were asked to perform it, they would be prevented from accomplishing the job for which they are equipped; namely, to give objective advice on the current state of the economy and on measures which might promote economic stabilization.

In my view, the Council should be a group of highly competent professional economists whose job it is to sift and place at the disposal of the President, in a comprehensible form, all the relevant accumulated knowledge, theoretical and empirical, of the entire economic profession. This is a tremendous task. If done well, it must be done by men who are primarily scholars rather than practical politicians. And if done well, it is a full-time job which leaves no time for political activity.

I do not mean to say that political work is unnecessary. Mr. Bailey has performed a great service in emphasizing that the job of getting economic policy adopted does not end with economic advice. Yet I doubt that the persons who are competent to give economic advice will also be effective as political operators. And I think that asking them to do both jobs will prevent them from doing either.

Obviously, as good economists, the members of the Council should not ignore political realities in formulating their advice. Also, I can agree with Mr. Bailey that the President should have the right to appoint and remove the members of the Council at his pleasure. He should have advisers with whom he can work and who are sympathetic toward his aims. But the Council should be primarily concerned with offering sound economic advice rather than with political expediency or political action.

Doubtless our government needs stronger political leadership; but it also needs more honest, disinterested advice on what is the right thing to do in order to achieve given ends. In the field of disinterested advice, professional economists have something to offer; in the field of political leadership, they have precious little to offer. I think economists should stick to their lasts.

Mr. Turner's position, as I understand it, is that stabilization policy requires forecasting; that within recent years we have learned to forecast with considerable reliability; and that we should confidently use our newly acquired skill in the formulation of stabilization policy.

I agree that considerable theoretical and statistical progress has been made in recent decades. I also agree that governmental economic policy has been fairly appropriate within recent years—though I suspect the explanation lies largely in serendipity and in forecasting by assumed momentum.

Regarding our ability to forecast the future reliably, I remain a skeptic. I have been profoundly impressed by the consistent differences of opinion among competent economists as we have headed into each minor recession since World War II. In each case, some have warned of inflation, some have expected a minor recession, some have envisioned a major depression, and some have looked for no change. In this guessing game, some have been right for the wrong reasons, some have been wrong for the right reasons, some have been wrong for the wrong reasons, and doubtless some have been right for

the right reasons. But have those who have been right for the right reasons been consistently right? And, if so, has this been a matter of chance or luck? Even if there are some conspicuously successful forecasters, how does a government identify them and see to it that they are in positions of influence?

Perhaps we need a statistical study of forecasters and their forecasts—with their annual batting averages published in the financial pages—in order to identify those persons who ought to be the official forecasters for stabilization policy.

It seems to me that we are not yet ready to speak with much assurance about future economic conditions. We still have not taken the really crucial test; namely, prediction of a major downturn. If and when such a catastrophe comes I have no doubt there will be those who will have foreseen it. But how are we to know which forecaster to listen to before the fact?

As you see, I am inclined to be a bit more pessimistic than Mr. Turner about our ability to forecast. On the other hand, I am more optimistic than he about the efficacy of built-in flexibility and the usefulness of compensatory action after the fact. Once we are in a depression or inflation, the fact can be recognized. At that time, there is some justification in forecasting by assumed momentum. At that time, moreover, political obstacles to fiscal policy and other stabilization measures are likely to be weaker than they were before the fact. Hence I conclude that in our present state of knowledge we had best continue to rely on compensatory policies rather than on policies based on specific forecasts which will at best have uncertain reliability.

RICHARD A. LESTER: Professor Turner asks that the Council of Economic Advisers face up to its statutory duty to forecast economic magnitudes. The fact is that for the past year members of the Council have made a number of predictions of one sort or another. For instance, last June at a press conference the chairman made a forecast with respect to capital investment, after the finger had been put on him at a presidential press conference. Professor Turner's plea, I take it, is for more systematic and well-documented forecasts and fewer economic forecasts via speeches and press conferences.

Professor Bailey warns that the Council members are participants in national policy making and should face up to the implications of their political positions. His admonition raises the question whether Council forecasts are not bound to contain political bias. At various times since 1946, Council members' predictions appear to have been designed to influence Congressional action or private spending, and it may well be that the function of policy formation and advocacy and the function of forecasting economic conditions should not be merged in a single agency.

At the meetings of this Association five years ago, Professor Erik Lindahl explained that in Sweden a group of economic experts in the government performs the technical task of calculating economic developments under alternative assumptions with respect to governmental policy and programs. The choice of the policy and programs is a separate function left to the political authorities. In the performance of its technical task of forecasting results under varying assumptions, the Economic Research Institute, headed

by Professor Erik Lundberg, has enjoyed a relatively independent position while housed in the Finance Department, and it apparently has avoided a political bias in favor of the government in connection with its forecasting activities.

In my opinion, serious consideration should be given to the establishment of some such semi-independent group of experts in the use of forecasting techniques in Washington. I have little faith in mechanistic methods of forecasting, and I am sure that the forecasts of any expert group would frequently be wrong, but a continuing agency would learn from experience and from the professional criticism of others. Such a group might be located, to use Professor Bailey's words, "in a dark corner of the Budget Bureau." Unlike the members of the Council of Economic Advisers, they should not change with each change of administration; continuing tenure would give them protection from—should I say "undue"—political influence and also the advantage of accumulating experience.

In looking back at the year 1954, I am surprised to find how close some private business forecasts came to predicting developments in, say, the level of the Federal Reserve index of industrial production or unemployment levels. Their January, 1954, forecasts contrasted with the Council's optimism for the immediate future. Perhaps there is a lesson to be learned in this difference of predictions.

Personally, I would place more stress on forecasts for the intermediate period than has been the practice in Washington. By intermediate I mean one to three years hence—specifically now that would be January, 1956, to January, 1959. Over the twelve months immediately following the Council's report, heavy reliance must be placed on built-in stabilizers and on discretionary action by the Executive Branch that requires no Congressional action that year, such as monetary policy. (Speaking of built-in stabilizers, the Council's recommendations last January with respect to state unemployment benefits were rather naïve and fruitless, and its discussion of minimum wages harked back almost to Nassau Senior. Lack of state or federal action to correct benefit levels under unemployment compensation that have been flattened down by increasingly low ceilings has given a great push to the guaranteed annual wage in such industries as automobiles.)

Each year the Congress should consider and take action to cover the forthcoming intermediate period. Admittedly, changes in the international picture make such planning and programing difficult and subject to alteration from time to time. It is, however, hazardous to neglect the intermediate years if the private groups who forecast so well for 1954 come close to being correct in their current forecasts of industrial production and employment for the years 1956 and 1957.

This country cannot afford to waste resources through idleness to the tune of 30 billion dollars of gross national product a year or three to five million unemployed. We need too badly such items as schools, roads, housing, and defense, not to mention the effects of unnecessary unemployment upon internal morale and our international prestige. Council Chairman Burns pointed out last October here in Detroit that "we are living in an age of

revolution" in which our economic system is in a world struggle for survival with communism and that we must, therefore, "be ready to take vigorous steps to help maintain a stable prosperity."

Forecasting and programing for the intermediate period should help to bring down to earth the repeated promises or threats of "bold steps," by focusing attention on a period longer than month to month or quarter to quarter. Of course, I am not unmindful of the fact that federal administrations have a four-year term and may find it difficult to plan beyond the next presidential election. Planning for the intermediate period is, however, one bold step that should be tried. It might very well help to increase the economic light and reduce the political heat.

CYCLICAL EXPERIENCE IN THE POSTWAR PERIOD

THEORETICAL SIGNIFICANCE OF THE 1949 RECESSION

By Rendigs Fels
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There have been a number of good discussions published on the recession[1] of 1949, among others by one of the discussants at this session. The chief reason for bringing up the subject again is to use the episode to throw light on business cycle theory.

I shall be especially concerned with why some cyclical downswings seem to cumulate, resulting in severe depressions, whereas others come to an end quickly. Before I say anything more about cumulative contractions I had better define the term. By cumulative contraction I mean a business cycle downswing in which aggregate money demand for goods and services (or gross national product in current dollars), real consumption, and real private domestic investment all decline in at least two successive quarters (seasonally adjusted), the decline in the second quarter being greater than in the first. The idea of a cumulative contraction, which gathers momentum like a snowball rolling downhill, is familiar in the literature. But how do we distinguish cumulative contractions from any business cycle downswing? The mechanism of the cumulative contraction has two aspects: one monetary and one real. A reduction in output in current dollars ordinarily reduces disposable incomes (in current dollars), which reduces investment, and so on. Similarly, a reduction of real output reduces real investment, etc. It is possible for a contraction in money terms to occur without a contraction on the real side and vice versa, but in the actual world one kind of contraction cannot go on for long unless accompanied by the other. Consequently, the first step in ascertaining why a given business cycle downswing was mild is to find out whether both kinds of contraction occurred. For example, during the downswing which the National Bureau of Economic Research recorded as occurring in 1945, real consumption rose; therefore, there was no cumulative contraction. In cases where the downswing involves both the money and the real aspects of the mechanism, the next step is to inquire whether the downswing cumulated; i.e., gathered momentum. Consequently, the definition of cumulative contraction includes the proviso that the decline must ex-

[1] I define a recession as a business cycle downswing in which there is no cumulative contraction. I define a business cycle downswing as the period between a peak and the succeeding trough as determined by the National Bureau of Economic Research (see Arthur F. Burns and Wesley C. Mitchell, *Measuring Business Cycles* [1946], p. 78).

tend over two quarters and must be greater in the second than in the first.

The question why some but not all downswings result in severe depressions is important for theory. In some theories, such as that of Colin Clark and, to a lesser extent, John R. Hicks, the economy is inherently unstable, so that any downswing will lead to a severe depression unless some exogenous force intervenes. In those theories which utilize the distinction between major and minor cycles, on the other hand, downswings are mild if long-run investment opportunities are favorable and severe if long-run investment opportunities are unfavorable. Professor Hamberg and I both adhere to the latter view, and I am inquiring whether the 1949 experience proves us right.

The question why some downswings are severe, others mild, is not only interesting theoretically but also important practically. Formerly, when economists believed that full employment was the normal state of affairs, it was appropriate to focus on the upper turning point; that is, on the question why the economy should ever lapse from normal. We now know that there are a number of reasons why a downswing may get started. In the present economic and political climate of the United States, we can expect downswings to get started from time to time, as they have in the past. The problem of maintaining stability will be to keep the downswings minor. To do this we need to know a good deal more about what determines whether the downswing becomes a recession or a depression.

The downswing of 1949 is commonly referred to as an inventory recession. The reason for this is simple: the decline in inventory investment was actually greater than the decline in gross national product. I have no quarterly figures for GNP in real terms, but its decline was probably divided about evenly between output and prices. As usual, the fall in output was concentrated in manufacturing and the fall in prices in agriculture. Total civilian employment fell little more than 1 per cent between the fourth quarters of 1948 and 1949. Unemployment rose more than employment fell because the labor force was growing, but the decline of employment is a better measure of the force of a cyclical downswing. The contraction was evidently extraordinarily mild. It was also unusually short. The National Bureau of Economic Research dates the peak in November, 1948, and the trough in October, 1949, giving the contraction a duration of eleven months. Out of twenty-three contractions since 1857, only four have been shorter.

Few illustrations of the traditional theory of cyclical contraction can be found in the recession of 1949. It is true that in particular markets there was an "inventory-deflation spiral . . ., with reduced inventory investment driving prices down and falling prices inducing

smaller inventory investment" (Elmer C. Bratt, *Business Cycles and Forecasting* [4th ed.; Richard D. Irwin, Inc., 1953], page 346), and with the cuts in output decreasing the need for inventories and leading to still further cuts in inventory investment and output. It is true also that the decline in inventory investment was great enough to induce declines in a number of aggregate measures of business activity—not only GNP, employment, and industrial production, but also disposable income and investment in producers' durable equipment. These declines undoubtedly contributed in familiar ways to prolonging the downswing.

But one important aggregate was scarcely affected at all. Personal consumption expenditures in current dollars fell off in only one quarter, the first quarter of 1949. (Consumption of nondurables also fell in the second and third quarters, but this was more than offset by rises in durables and services.) If I had quarterly statistics of real consumption, they would probably show no decline in any quarter. Since a decline of real consumption is an integral part of a cumulative contraction, it is clear that no cumulative contraction (as I have defined the term) got under way. The fact that real consumption was maintained makes it easy to understand why the recession of 1949 did not degenerate into a depression. But this is only a first step in the analysis.

We must next inquire why consumption held up so well. To some extent the result can be credited to the combined effects of built-in flexibility, delayed effects of the tax reduction of the spring of 1948, and increased government expenditures; but if we take the statistics at face value (a hazardous procedure), we conclude that this was not the major factor. More important was the rise in the consumption function (see Table 1).[2] The reduction in disposable income was more than offset by a decrease in personal saving.

TABLE 1

GNP ET HOC GENUS OMNE

(Billions of current dollars, quarterly rates, not adjusted for seasonal variation)

	GNP	Personal Income	Disposable Income	Consumption	Saving
Fourth quarter, 1948	70.9	54.4	50.7	49.0	1.7
Fourth quarter, 1949	67.7	52.7	49.0	49.7	−0.7
Change	−3.2	−1.7	−1.7	+0.7	−2.4
Percentage change	−4.5%	−3.1%	−3.4%	+1.4%	

SOURCE: *Survey of Current Business.*

[2] Let us assume that normal marginal propensity to consume out of disposable income is one-half (the exact MPC assumed makes little difference to the comparisons that follow). With the decline in disposable income shown in Table 1, we would expect that consumption would have declined by 0.85 billion dollars. It actually rose 0.7 billions. This implies that

There are three explanations for the rise in the consumption function.[8] The best-substantiated is increased availability of automobiles (except for the fourth quarter, when model changing slowed output). This was one industry which had not caught up with demand in 1948. Automobile purchases in the next year increased by 2 billion dollars. To some extent, the fact that at the time of the recession an important industry was still expanding to meet demand deferred from the war must be regarded as an accident, but to a considerable extent this was a probable result of the forces which produced the inflationary expansion of 1946-48. Those forces made a bunching of the catching-up stages for different industries likely, but one could hardly have expected that all important industries would have reached that stage simultaneously. Here was an internal or endogenous mechanism which tended both to produce a business contraction and to ensure that the contraction would not make much headway.

The second explanation for the rise in the consumption function is well established, but its effects are difficult to measure. Consumer credit controls, which had been reimposed on September 20, 1948, were relaxed on March 7 and April 27, 1949, and finally allowed to lapse altogether on June 30. Statistics on consumer credit could readily be arranged to support the contention that the impact on consumption was considerable, possibly amounting to an annual rate of several billions of dollars. But the behavior of these statistics can be explained, at least in part, on other grounds such as increased availability of automobiles or the return to prewar seasonal patterns. Abolition of consumer credit controls was, of course, an external or exogenous factor.

A third explanation for the rise in the consumption function is plausible, but it seems impossible to get strong evidence for it. Slichter

consumption was 1.55 billion dollars higher in the fourth quarter of 1949 than it would have been had the consumption function not risen. If there had been no built-in flexibility and no change in tax rates, disposable income might have fallen by the full amount that GNP fell, namely, 3.2 billion dollars; i.e., 1.5 billions more than it actually fell. If we still assume that the marginal propensity to consume is one-half, consumption was 0.75 billion dollars higher in the fourth quarter of 1949 than it would have been without built-in flexibility and the tax cut. Therefore, under these assumptions the rise in the consumption function appears about twice as important as built-in flexibility plus tax cut. This no doubt puts an undue burden on the statistics, but there seems to be no question that the consumption function rose. In Table 1 I have taken advantage of the fact that the peak and trough both came in the fourth quarter of the year (ignoring the fact that the third quarter of 1949 was about as low as the fourth); this made it appropriate to use quarterly data not adjusted for seasonal variation, since the unadjusted figures presumably are more reliable. If I had followed the usual practice and used seasonally adjusted annual rates, the rise in the consumption function would have appeared nearly three times as important as built-in flexibility plus tax cuts; this would have been true irrespective of whether the third or the fourth quarter of 1949 was taken to be the trough.

[8] In addition, it should be mentioned that liquid assets were still fairly high and consumer debts fairly low; but these are reasons why the consumption function could rise, not why it did rise. The lag in adjusting to reduced incomes also deserves mention, although it could not explain why consumption in current dollars rose.

asserted that consumers in the fall of 1948 began postponing expenditures because they anticipated falling prices. Since consumers' stocks of goods were low and their bank deposits still large, he predicted that postponement of consumption would not last long. Since Slichter is a careful observer of contemporary business conditions, we can regard his assertion as a primary rather than a secondary source; and since he used it to make a successful prediction, we have a more convincing reason for believing his hypothesis than the mere weight of his authority. But there are nevertheless reasons for skepticism. For one thing, Slichter on a later occasion told a different story. For another, a single prediction may be right for the wrong reason. We therefore want confirming evidence. The "1949 Survey of Consumer Finances" provides some confirmation, though it is none too strong. If Slichter was right, here was another endogenous mechanism tending both to bring about a downturn once inflation died out and to limit the extent of the downswing.

The rise in the consumption function was not the only important reason why the recession was mild. As Gordon and Hamberg have stressed, autonomous investment was high; or to put the same matter in other words, long-run investment opportunities were favorable. Investment was still directed in large measure at shortages inherited from the war and therefore was not much affected by minor fluctuations in business activity. This is why investment in both construction and in producers' durable equipment fell so little. It should be noticed, however, that an endogenous factor was at work on the construction of houses. A decline in costs, as building materials fell in price and premium wages disappeared, bolstered construction because builders were able to shift into production for a lower priced market. In addition, an external factor may have affected private investment; namely, easier credit conditions following reduction in the reserve ratios required of member banks. But the main point undoubtedly was the autonomous character of private investment other than most inventory investment.

While we are on the subject of autonomous investment, we must discuss the most important external factor of the 1949 recession: the steady growth in government purchases of goods and services throughout 1947, 1948, and the first half of 1949. The increase in the first quarter of 1949 amounted to nearly three billion dollars and was caused primarily by higher military expenditures and increased foreign aid. Inasmuch as GNP declined only ten billions during the recession, seven billions of it in the first quarter of 1949 (annual rate), it can be seen that this was of great importance in keeping the contraction from cumulating. The level of government purchases reached in the first quarter was maintained throughout the year, a decline in the federal

component in the last half of the year being offset by rising state and local expenditures.

The foregoing analysis is still not adequate to explain why the recession was so mild. In the case of the downswing of 1920-21, there is evidence of strong autonomous private domestic investment and a rise in the consumption function; yet the earlier downswing quickly degenerated into a violent deflation. The chief reason for the difference appears to be speculation in inventories in 1919—a factor that was almost totally absent in the inflation of 1946-48. The history of depressions suggests that a speculative boom is a predisposing factor for a severe downswing. But businessmen were cautious during the upswing following World War II. The reason for their caution lay in their memories of the depression of the thirties, knowledge of what happened in 1919-21, and the highly publicized predictions (themselves partly the result of the depression of the thirties) that World War II would be followed by a depression.

Another difference between the downswings of 1921 and 1949 lay in the structure of the economy, which led to a different state of expectations. The inflation during and after World War I created the expectation that prices would have to fall; and whether that expectation was rational or not, in fact there were no serious obstacles to keep them from tumbling down. Expectations that prices would fall meant that when they began to fall they soon were falling precipitously. By the end of World War II, strong impediments to falling prices had grown up: powerful labor unions, price supports for agricultural products, and (it seems to me) an industrial shift towards maintaining prices in the face of falling demand. In addition, there were indirect assurances against falling prices: unemployment insurance and a government policy of actively combating depressions. These well-known developments gave businessmen and consumers the expectation that prices would not in any case fall very far, and the expectation in turn was a factor in keeping their decline moderate. There have been many theoretical contributions to the question of whether price inflexibility helps or hinders in maintaining full employment. The contrast between 1921 and 1949 suggests that in the latter case inflexibility helped avert what otherwise might have been a serious cyclical contraction.

Several years ago I published the statement that price flexibility in 1920-21 "appears to have shortened the depression by increasing aggregate spending." ("The Effects of Price and Wage Flexibility on Cyclical Contraction," *Quarterly Journal of Economics*, November, 1950, page 608.) There is no contradiction between this and the statement just made. On account of the speculative boom of 1919-20, there

would have been a cumulative contraction in any event. Price flexibility made the cyclical decline in prices greater but made the decline in output less; hence, price flexibility in that case was beneficial. The lack of price flexibility in 1948-49 helped keep a cumulative contraction from ever starting. The contraction of 1920-21 would have been worse if prices had not been flexible; the contraction of 1949 would have been worse if they had been flexible. This tends to confirm my earlier findings that price flexibility can help or hinder a cyclical contraction depending on the special circumstances of each case.

Such were the factors at work. The process whereby they brought the recession to an end can be described in brief compass. The small decline in output together with the rise in government spending and the maintenance of consumption enabled businesses to do in a short time what little liquidating of inventories they felt desirable. They soon were in a position of having to expand output in order to keep inventories from falling too far. When they did so, expansion got under way.

Now let me summarize the reasons for the mildness of the recession of 1949 preparatory to discussing what it does—and also what it does not—tell us about the nature of downswings in general. First, there were several endogenous or internal mechanisms at work: recent experience with severe depression, which served to prevent a speculative boom during the upswing; shortages inherited from the war,[4] with the high probability that some of them would not be satisfied by the time the recession began; the decline in the cost of building houses; and (possibly) the difficulty consumers had in continuing for long the postponement of expenditures which may have contributed to the upper turning point. Note that none of these endogenous forces can be depended on to operate in all future contractions. Second, there were two changes in the structure of the economy: the great increase in the importance of built-in flexibility and (to demonstrate how awkward the English language is) the increase in price inflexibility. The former can be depended on to help limit future downswings and the latter cannot. Third, there were several favorable external or exogenous forces: the increase in government purchases, the end of consumer credit controls, the cut in taxes, and the lowering of required reserve ratios of member banks. All these forces combined to prevent a cumulative contraction from getting under way. Which factors are classed as exogenous depends on the purpose at hand. The factors resulting in high, sustained, autonomous investment could appropriately be called exogenous; but I omit them. Since the question I am investigating is

[4] The war, itself, was exogenous, but the reaction of the economy to the shortages it created may properly be regarded as endogenous.

whether in a period of favorable private long-run investment opportunities a cumulative contraction can get under way and lead to heavy unemployment, it is irrelevant to inquire whether the reasons for the favorable opportunities are endogenous or exogenous.

I put the matter this way in order to stress that the recession of 1949 throws no light on the question I posed at the beginning: do we or do we not live in such an unstable economy that any downswing is potentially disastrous? External events, as well as some internal ones which cannot always be depended upon, intervened to prevent a cumulative downswing. If one had started, we just do not know what the result would have been, however tempting it may be to form a judgment and defend it as eternal truth. Colin Clark may or may not have been right when he wrote that "any fall . . . which has once reached a certain velocity will accelerate itself, and nothing is likely to stop the fall until investment has been reduced to the minimum replacement level. . . ." ("A System of Equations Explaining the United States Trade Cycle, 1921 to 1941," *Econometrica,* April, 1949, page 115.) I believe that Professor Hamberg went too far when he wrote "that an economy can withstand the impact of such inventory recessions as those experienced by the U. S. during the twenties and again in 1948-49, without tumbling into a major depression would appear as impressive testimony to the *stability* of the economy." (*Metroeconomica,* 1954, page 63—Hamberg's italics. This statement should be interpreted in conjunction with his discussion of 1948-49 in the *Economic Journal,* 1952, page 14, where he felt that the 1949 recession "bode [d] ill for the future.")

My conclusion disappoints me. Like Professor Hamberg, I want to use minor recessions such as 1949 to prove that our economy is not nearly as unstable as Hicks and Clark believe. But as long as this is an open question, economists ought to give different advice to the President and Congress when a business contraction starts than if we were sure that with investment opportunities favorable contractions come to a quick end by themselves. The temptation is great to conclude, consciously or unconsciously, that because the 1949 recession came to an end quickly future contractions will do the same.

I must, however, defend my view against an econometrician who tried to use this recession to throw doubt on Hicks's hypothesis of extreme instability. He started with a three-equation model consisting of the multiplier, the accelerator, and the national income identity, and fitted American statistics for 1947-50. He found a value for the accelerator far below what is required for explosive behavior and concluded that Hicks's hypothesis of an explosive accelerator appeared to be contradicted by the facts of this case. (Gene H. Fisher, "*A Simple*

Econometric Model for the United States, 1947-50," *Review of Economics and Statistics*, February, 1952, pages 46-48. He found an accelerator of 0.482, whereas to be explosive the value would have to be greater than 1.0.) But about two and a half of the four years he studied represented full employment. Under Hicks's theory, full employment may (and in this case undoubtedly did) reduce investment below the amount firms desired. For these years it is easier to reconcile a low value of the accelerator with Hicks's theory than it would be an explosive one.

It is not too difficult to reconcile Hicks's theory with the facts of 1948-49. His theory includes allowance for humps and slumps in autonomous investment. From the point of view of his theory, the 1946-50 cycle was a Bactrian camel. As you doubtless know, a Bactrian camel has two humps separated by a small slump.

In saying this, I do not mean to defend Hicks's theory. As Schumpeter once said, when we hang a man who deserves to be hanged, it is nevertheless important that we do not hang him for the wrong reason. (I must hasten to say that I do not believe Hicks's theory should be liquidated, much less that eminent economist's person; I am discussing only the application of his theory to one particular cycle.) The proper verdict to render on Hicks's theory in connection with 1948-49 is that it is not very helpful. To paraphrase Schumpeter again, autonomous investment is only a label for a blank space, and if we fill this blank space by some such thing as humps and slumps, we are filling a blank with another blank.

All of this is negative. Let me wind up with two positive suggestions for theory. Part of the rise in the consumption function was due to external events but part—perhaps the larger part—was not. This played a crucial role in heading off a cumulative process. It would be trite to say that the business cycle theory of the future must explain changes in the consumption function. The 1949 experience suggests that rather sudden shifts in the consumption function not only are significant for explaining business cycles but also may themselves have a cyclical origin.

Lastly, the speculative boom, which played a prominent part in some older theories but in recent theories is usually omitted, must be retained and explained. The presence of such a boom in 1919 and its absence in 1946-47 is one of the obvious differences between two cycles so similar in origin and so different in result. Had there been a speculative boom to collapse in 1948, it would have greatly changed subsequent events. The kind of explanation of the occurrence of speculative booms suggested here is old and familiar, running in terms of the recent experience with business cycles of business managers and investors.

BUSINESS FLUCTUATIONS IN THE UNITED STATES SINCE 1951: SELECTED DEVELOPMENTS

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Three fairly distinct economic movements have occurred in the American economy since 1951. First, the sharp rise in gross national product which followed the outbreak of the Korean war was interrupted early in 1951 by an inventory crisis although rising national security expenditures still maintained and gradually increased the gross national product during the period preceding the steel strike in mid-1952. Next, a resurgence in both private investment and consumption spending, beginning in the fall of 1952, carried gross national product and industrial production into new high ground in the spring of 1953. Finally, this peak level performance gave way when inventory and national security expenditures were reduced. The declines in industrial production and gross national product have apparently been checked, however, due largely to the expansion in new construction and consumption expenditures, an increased flow of government transfer payments, and reduced federal taxes.

Detailed examination of each of these periods of major change undoubtedly would be desirable and rewarding. However, time considerations severely limit the scope of the present analysis. As a consequence, the objectives of this paper are confined to three: to digest the basic economic developments from 1950 to 1954; to select, if possible, the crucial factors which contributed to the major economic swings of the period; and to advance some tentative observations concerning the near-term prospects in the economy.

Economic Developments, 1950-54

Gross National Product:

From an annual rate[1] of 264.9 billion dollars in the first quarter of 1950 (hereafter, 1950 I), gross national product, in current dollars, rose by 105 billions, or approximately 40 per cent, to a peak of 369.9 billions in 1953 II. In real terms, the increase was at least one-quarter. Almost 45 per cent of the rise, however, was concentrated in three quarterly periods: 18.5 billion dollars from 1950 II to III; 14.3 billions from 1950 IV to 1951 I; and 14.3 billions from 1952 III to IV. The total increase during the six quarters from 1951 I to 1952 III was only 24.9 billion dollars. Thus the behavior of the post-Korea gross national

[1] Data on the components of gross national product refer to annual rates unless otherwise stated.

product was characterized by sharp spurts interspersed by much slower periods of growth.

Following the peak in 1953 II, gross national product began to decline and at its low in 1954 III had fallen by 3.9 per cent, or about the same percentage as in the 1948-49 recession.

Personal Consumption Expenditures. Turning now to major components of the gross national product, the two waves in consumption expenditures following the outbreak of the Korean war are well known. From 189.1 billion dollars in 1950 II, personal consumption rose to 202.9 billions in III, and then declined to 198.8 billions in IV. Following their peak of 210.0 billions in 1951 I, they fell to 204.4 billions in the next quarter largely because of a 4.4 billion decline in expenditures on consumer durable goods. Consumption expenditures gradually rose thereafter to 218.2 billions in 1952 III. They then increased by almost 6 per cent to 231.2 billions in 1953 III as disposable income continued to grow and consumer credit rose sharply by 4.6 billions. More than one-half of this increase in consumption was from 1952 III to IV. Since declining to 229.7 billions in 1953 IV, consumer expenditures have risen moderately.

Gross Private Domestic Investment. The maximum increases in gross private domestic investment were 9.1 billion dollars from 1950 I to II and 9.2 billions from 1950 III to IV. Producer durable equipment and business inventories were responsible for two-thirds of the first rise while business inventories more than accounted for the second. From the peak of 62.6 billions in 1950 IV, gross private domestic investment feil by almost 25 per cent to 47.2 billions in 1952 II. The explanation is, of course, that investment in business inventories declined from an accumulation of 14.7 billions to minus .9 billions. The inventory problem was particularly acute for dealers in consumer durable goods. In the ensuing boom of 1952-53, private investment, led by business inventories, recovered to 55.9 billions in 1953 II and then fell by one-fifth to a low of 44.5 billions in 1954 I. All but 1.8 billions of this decline may be accounted for by the change in inventories which fell from 5.4 billions to minus 4.2 billions. An important offsetting factor has been construction which has reached new peaks in each quarter of 1954.

Federal Government Purchases of Goods and Services. Federal government purchases of goods and services rose steadily through 1953 II, with the exception of a billion dollar decline from 1952 II to III. At their peak of 62.2 billions in 1953 II, federal government expenditures for goods and services were three times as large as in 1950 II and III. National security items increased even more rapidly, rising from 17.2 billion dollars in the quarter preceding the Korean war to 54.3 bil-

lions in 1953 II, although their rate of increase began to decline early in 1952. Through 1954 III, federal government expenditures have declined by 14.3 billions to 47.9 billions, of which all but 2.2 billlons have been in national security expenditures.

State and Local Government Expenditures on Goods and Services. State and local government expenditures on goods and services have increased each quarter since 1950 II except for a decline of one-tenth of a billion dollars from 1951 II to III and one-half billion dollars from 1953 I to II.

Other Economic Series:

The other economic series which will be reviewed here are personal and disposable personal income, industrial production, prices, and interest rates.

Personal and Disposable Personal Income. Special interest attaches to personal income and particularly to disposable personal income because of their close relationship to the flow of expenditures. Personal incomes rose each quarter from 1949 III to 1953 III but declined moderately through 1954 I. Since then personal incomes have risen slightly.

Disposable personal income has shown even greater strength. With the single exception of 1952 I, disposable personal incomes have either remained unchanged or risen every quarter since 1949 III. Two factors bear primary responsibility for the increase in disposable personal income from 1953 III to 1954 III as gross national product was declining: the rise in government transfer payments from 12.6 to 14.7 billion dollars, and most important, the fall in personal tax and nontax payments from 36.3 to 32.9 billions.

Industrial Production. The Federal Reserve Board index of industrial production provides a relatively sensitive measurement of real production developments. From a low of 94 in the 1949 recession, total industrial production had recovered to a new post-World War II peak of 112 in June immediately preceding the Korean war. Subsequently, the index rose by 10 points, or 9 per cent, to 122 in December, 1950. It remained unchanged during the first five months of 1951 and then declined to 118 where it remained from August through October, 1951. The steel strike is reflected in the decline of industrial production from 121 in March, 1952, to 115 in July, 1952. It recovered rapidly thereafter, rising by 22 points, or almost one-fifth, to 137 in both May and July, 1953. Industrial production then fell by just over 10 per cent, to 123, in March and April, 1954, and was still at that level in August.

Behavior of Prices. Consideration must now be given to price changes. From a low of 100.4 in February, 1950, the consumer price

index rose by 10 per cent, to 110.3, in March, 1951. During the next two and a half years, consumers' prices increased by less than 5 per cent to their peak of 115.4 in October, 1953, and have receded less than 1 per cent since then.

The index of wholesale prices had reached 100.2 in June, 1950. Eight months later it had risen to 116.5. This proved to be the peak as wholesale prices, led by farm prices, fell to 109.4 in April, 1953, and remain at approximately this level today.

Interest Rates. Finally the movements of interest rates reflect the changing demand for and supply of funds and the dear and cheap money policies of the monetary authority. Yields on long-term US Treasury bonds provide a sensitive index of changing monetary policies. From a low of 2.19 per cent in December, 1949, yields rose gradually to 2.39 per cent a year later. Following the accord in March, 1951, yields rose to 2.65 per cent in June, 1951, and finally reached a peak of 2.74 per cent in January, 1952. They fell to 2.57 per cent in May, 1952, and rose gradually during the remainder of the year. The tighter money policy of early 1953 is clearly recorded in the rise of yields by over one-third of a per cent: from 2.75 per cent in December, 1952, to 3.09 per cent in May and June of 1953. Since that time yields have fallen again to a low of 2.47 per cent in April, 1954, and recently have firmed slightly.

Summary:

Summing up the general features of the period, the economy has been relatively stable as compared with pre-World War II cycles. The major fluctuations in gross national product have resulted primarily from alterations in rates of inventory, consumption, and national security expenditures. Producer durable equipment expenditures have been somewhat more stable than in many earlier fluctuations. Construction was also highly stable from the Korean war through 1952, ranging from 22.7 to 24.2 billion dollars. In 1953, however, it averaged 25.5 billions and has risen to a new peak in each quarter of 1954. Of unusual interest is the fact that from 1951 to the middle of 1953, whenever a major component of expenditure began to falter, some offsetting strength appeared. The relative weakness in consumption in 1951 led to an inventory crisis, particularly in durable consumer goods, which nevertheless failed to reduce the gross product because of the rising level of national security expenditures. Then as the rate of expansion in the latter tapered off, private spending revived partly to replenish stocks following the steel strike of 1952 but also facilitated by the expansion in consumer loans. Monetary policy was tightened early in 1953. Shortly thereafter, as consumption weakened again, national

security expenditures also began their decline and inventories started to accumulate. The heavy disinvestment in inventories and declines in national security expenditures were offset, but only in part, by increases in construction, consumption, and government transfer payments, and by tax reductions. As a consequence, the 1953-54 recession was mild, more comparable to the decline of 1927 than other pre-World War II recessions and approximately as severe as that of 1948-49, depending upon the statistical comparisons drawn.

Causal Factors

This is the empirical record. The areas of expansion and contraction have seldom been so clearly evident. As will appear below, however, despite the clarity of the statistical record, caution would still seem to be justified in interpreting the causal relationships, particularly in the latter part of the period.

From 1951 to the Steel Strike of Mid-1952. The inflation of the post-Korean boom was stopped in 1951 when the consumption function shifted downward. It is likewise probable that inventory expenditures declined also both because consumption weakened and because the cessation of the price rises ended the opportunity for further speculative inventory profits. A variety of factors weakened the forces of demand. For one thing, the extremely high level of expenditures had built up consumer stocks which appeared adequate for the time being once it became apparent that the flow of production of consumer goods would not be contracted excessively. Second, data from the Survey Research Center of the University of Michigan indicate that in its June, 1951, surveys more consumers thought it was a poor time to buy because of high prices than in subsequent surveys of 1951 and 1952. Third, merchants had overordered during the period of rapidly rising prices and hastened to restore more normal inventory-sales positions. In the fourth place, the harder money policies suggested that inflation was to be curbed. And, finally, when price ceilings were established consumers were encouraged to believe that the inflation was over.

In spite of the inventory crisis, gross national product continued to rise largely because of the further expansion in federal national security expenditures from 27.4 billions in 1951 I to 50.0 billions in 1952 II, an increase of 22.6 billions while gross national product went up 22.1 billions. Increases in personal consumption, net foreign investment, state and local government expenditures, and other federal expenditures approximately compensated for the drop in gross private domestic investment, leaving the increase in national security expenditures as the major factor in the rise in gross national product.

The Boom of 1952-53: From the Steel Strike Through the Second

Quarter of 1953. During the 1952-53 boom, gross national product rose by 28.5 billion dollars, or 8.3 per cent, from 1952 II to 1953 II. Personal consumption expenditures which rose by 14.1 billions and gross private domestic investment which rose by 8.7 billions (2.2 billions in construction and 6.3 billions in business inventories), together accounted for 80 per cent of the increase in gross national product. The dominant factors in this boom clearly were consumption and gross private investment. The expansion of 4.6 billions in consumer credit and the move to replenish depleted stocks supply the primary explanation for the strength in consumption and gross private investment.

The Recession of 1953-54: From Mid-1953 Through the Third Quarter of 1954. The turning point in 1953, as well as the behavior of the 1953-54 recession, is easily described in terms of the fluctuations in the components of gross national product but the causal relationships are more perplexing. By far the most important changes have been in the rates of government purchases and inventory investment. Government purchases declined by 11.0 billions. National security expenditures declined by 12.2 billions and other expenditures by 2.4 billions but were partially offset by a rise of 3.3 billions in state and local government expenditures. Gross private domestic investment fell by 10.6 billion, of which business inventories amounted to 10.2 billions. Construction and consumption expenditures have been the primary factors in checking the decline. Inventory changes, however, undoubtedly were the major private expenditure force in the turning point of 1953, but the reasons for their behavior seem less obvious.

The relatively high rate of inventory accumulation in 1953 II suggests that some part may have been unintentional. Prices declined slightly during 1952 IV and 1953 I. Therefore there seems to have been no price incentive to accumulate inventories. Some weight perhaps should be given to acceleration forces in explaining the inventory behavior since there was only a modest expansion in personal consumption between 1953 I and III. Personal savings as a percentage of disposable income fell from 8.5 per cent in 1952 III to 7.7 per cent in 1953 I but rose to 8.0 per cent in 1953 III. In the Hicks-Harrod view of turning points this could have been evidence of an approach to the production ceiling or the operation of a weak accelerator. As to the first view, production does not seem to have encountered a ceiling since symptoms of resource strain (inflation, production bottlenecks, etc.) were absent. As to the second, a weakness in consumption might reflect a redistribution of income. If, for example, a short-run shift of income in favor of profit receivers affects significantly the propensity to consume (and this is far from estabished), then the empirical developments of the

spring of 1953 may lend some support to the underconsumption version of the Hicks-Harrod model. Thus profits after taxes, although still considerably below the levels of the first three quarters of the Korean war, averaged 2 billion dollars more during the first three quarters of 1953 than they did from 1951 II through all of 1952.

The one other change in the spring of 1953 which conceivably might have upset business calculations was the establishment of the harder money policies. Interest rates firmed which undoubtedly had some effects on the demand for and supply of funds as well as on general business expectations. In the words of the Council of Economic Advisers in the January, 1954, *Economic Report of the President*: "The volume of new private flotations continued at a very high level but some difficulties were encountered at that time in marketing securities and placing mortgages." Apparently only consumer credit, which rose substantially prior to the initiation of more restrictive money policies, pointed toward the resumption of inflation. But the major inflationary boom itself had terminated almost two years before and prices in fact were declining moderately at the time the decision was made to tighten monetary conditions. In retrospect, therefore, these policies seem neither necessary nor wise.

Near-term Prospects

The present problem is at least threefold: first, to reduce the level of unemployment which is between 4 and 5 per cent of the labor force and to eliminate part-time work; second, to provide 500,000 to 700,000 new jobs annually to take care of the growing labor force; and, third, to secure the normal increase in productivity of between 2 and 3 per cent per year which requires an annual growth in the national product of between 7 and 10 billion dollars.

Although the immediate prospects for achieving all three of these objectives are none too bright, an upturn in general business seems to be under way and is likely to continue for several months at least. National security expenditures have leveled out but other federal government expenditures are planned to increase moderately during the current fiscal year and state and local government expenditures will continue their slow climb. Consumption has been well maintained and is increasing although there is no reason to anticipate a sharp shift upward in the consumption function. In this connection, it is worth noting that at present levels of disposable income personal consumption would change by only 4.5 billion dollars, before any multiplier effects, if personal savings were to fluctuate between their high and low ratio to disposable income since 1951 I. Some help may be expected

from gross private domestic investment if construction gains offset declines in producer durable equipment expenditures and if disinvestment in inventories gives way to inventory accumulation.

This very cursory examination of the prospects for expenditure indicates that a moderate recovery may be forecast although the forces for a substantial upturn are not yet in sight. It should be observed, however, that in many earlier fluctuations unexpected forces have made important contributions to revival and expansion. Nevertheless, the fact remains that unless there is a significant improvement in one of the major components of national expenditures, the gains from increased productivity are likely to be lost in increased unemployment or perhaps disguised unemployment (shorter hours, reduced labor forces, etc.). The mildness of the slump in production during the 1953-54 recession may suggest that the short-term or cyclical problem is giving way to long-run considerations which are to raise the level of product and the general standard of living. Whether this proves true or not, it would still seem desirable to give more attention to the problem of the "long haul"—to analysis of the secular factors which can undergird a progressive economy.

DISCUSSION

JOHN LINTNER: The two papers by Professors Roose and Fels provide a good review of the 1949 recession and subsequent cyclical experience in terms of the observed changes in broad aggregates and indexes. The analysis of these developments in both papers offers much that will be useful in subsequent work. In keeping with the chairman's invitation to serve as a general discussant for the session, I shall address myself briefly to two broad points raised by these papers, leaving detailed comment to the other discussants. While neither of the points is new, both seem sufficiently important to justify comment in the present session.

My first point has to do with the adequacy of analysis in terms of such comprehensive but often inherently heterogeneous aggregates as those used by the present authors and by economists generally in most of their work on business cycles. (The most significant exception to reliance on such aggregates in the present papers is Fels's distinction between the behavior of automobiles and other consumer durables in the 1949 recession.) It is certainly true that most of the major advances in this field over the last generation can be directly attributed to the development of national income accounting and related statements of money flows, on the one hand, and to the formulation and (usually mathematical) exploration of the properties and implications of theoretical methods specifically oriented to such aggregates, on the other. No one would want to question the great significance of the advances which have been made along both these lines, nor even the current usefulness of such efforts and analysis. But serious questions do need to be raised concerning the adequacy of analyses which deal only with comprehensive aggregates to meet the demands increasingly being put upon economists in this area. The development of sounder judgments on prospective business conditions leading to more responsible policy decisions as well as the necessary further scientific progress through tests of existing theories and elaboration of still better theories are going to depend heavily upon much more attention to the detailed components and shifts in the structural composition of important aggregates than has usually been given. The fact that data on many of the important components of our global aggregates are not readily available or that they are not precise enough to support firm conclusions does not lessen the need for more analysis at this level. These considerations simply put an added premium on efforts to develop and refine the empirical data required for such investigations.

Time permits no more than a single illustration. For this purpose, consider the important issue of the existence and extent of non-random shifts in the consumption function over the cycle. Both authors treat the consumption function as a behavioral equation (as it should be), but in keeping with the usual analysis of such issues, both then go on to infer the presence or absence of shifts with behavioral significance from comparative movements in consumption and disposable personal income in spite of the fact that this income aggregate encompasses unincorporated businesses, farms, and other nonpersonal economic units. For brevity, I shall confine my specific comments to Fels's

finding that an upward shift in the consumption function was more important in maintaining a relatively high bottom to the 1949 recession than the combined effects of built-in flexibility, the delayed impact of prior tax reductions, and current increases in government expenditures. His argument runs that since disposable income fell between the fourth quarters of 1948 and 1949 by 1.7 billion dollars, consumption would have fallen a substantial fraction of this amount if the function had not shifted. Since consumption actually rose by 0.7 billions, the function must have shifted upward by 1.6 billions or more. If Fels had assumed a marginal propensity to consume, say, 0.8, the indicated upward shift in the consumption function would have been 2.05 billion dollars. (Differences in the assumed value for the marginal propensity to consume do not significantly affect the estimates given below because of the very small value estimated for the change in disposable income that would be expected to have a net effect upon consumption expenditures.) But between the two fourth quarters, there was a reduction of 1.9 billion dollars in the rate of inventory accumulation in unincorporated businesses and on farms. *Ceteris paribus,* this involved an equal reduction of like amount in both personal income and personal savings. (I am here ignoring the changes in bank debt usually associated with inventory changes, since in this period reduced inventory was accompanied by increased rather than by reduced indebtedness. Data are from Irwin Friend's *Individuals' Savings,* published in 1954 by John Wiley & Sons, especially pages 46 and 47.) With tax payments and accruals virtually constant as they were, such changes have a multiplier of one with no repercussion effects via induced changes in consumption. Exclusive of income simultaneously created by and automatically reinvested in increased noncorporate inventories, disposable income on the basis of the available figures rose by 0.2 billion dollars; at the same time, personal savings other than those "automatically" invested in such inventory increases declined by only 0.5 billions. The resulting shift indicated in the consumption function is less than ¾ billion dollars, which is less than the probable effect of built-in flexibility alone and consequently substantially less than the combined effects of such flexibility, changed tax rates, and increased government spending. Indeed, since the indicated size of the shift is considerably smaller than the margins of error in the data, it is not even clear that the consumption function actually shifted at all. A much more detailed analysis than is appropriate in these remarks—and based on much better and fuller data than are presently at hand—would be required to settle the issue.

In order to avoid unwarranted implications, let me add that, like the authors, I am inclined to believe that there are significant non-random (as well as random) shifts in the consumption function during cyclical fluctuations, but what they are and why they are is still vague pending much more extensive and detailed investigation. At this time, my concern is simply to illustrate the proposition that we must use more detailed breakdowns than those provided in the present national income aggregates to test our hypotheses and develop our insight. A balance must of course be struck at some point. Perfect homogeneity of components is unattainable. Gains in homogeneity and relevance to the actual data, motivations, and processes of de-

cision making must always be weighed against costs in terms of complexity of models, less accuracy in data, and so on. (Budget studies and other cross-sectional analysis can go far toward meeting many of these problems.) But the economic balance between aggregation and disaggregation for cycle analysis surely lies in the direction of more detailed study of the components making up our aggregates than has generally been the practice. This proposition seems clear enough in terms of the economists' traditional effort to push toward the point of equality between incremental gains and losses; it can perhaps be made even more forcefully in terms of seeking minimax solutions in the allocation of our efforts.

My second general observation suggested by the present papers concerns what we may reasonably expect in the foreseeable future in the way of "a satisfactory theory" of business cycles. Useful historical or empirical work necessarily involves major elements of testing hypotheses incorporated in existing or new theories. The implications of the indicated modifications of hypotheses must be explored theoretically and new formulations developed for subsequent testing. This combination of theoretical and empirical work has produced the very real progress toward more satisfactory theories of the cycle which has been achieved over the last quarter century, and continued scientific work along these lines will undoubtedly produce much more satisfactory theories than we now have. Such studies at the micro as well as the subaggregate and aggregative levels should throw valuable light on the determinants of different types of saving and consumption and both the real and monetary factors which most importantly influence investment expenditure. Important distinctions and valuable new insights will unquestionably be gained as attention is turned to the separate components of all that is now lumped together vaguely as "autonomous" investment and as allowance is made for the distinctive impact on the rest of the structure of equal absolute or relative shifts in such distinctive types of investment. These developments should be particularly important in relation to the central question of the relation between longer term growth and cyclical fluctuations.

It would be a mistake, however, to hold out the promise that these prospective developments will do any more than narrow the range of differences in judgment and advice respecting policy which economists offer policy-makers. Any economic theory is necessarily partial and subjunctive in character. Even if we had an adequate formulated and verified theory of the operation of what are generally regarded as endogenous factors in the cycle, there would continue to be major differences in judgment regarding the probable future impact of exogenous factors. Since behavioral equations adequate to explain changes in endogenous variables necessarily include exogenous variables (or parameters functionally related to the level or rate of change of such variables), the reaction mechanism of the system will depend on values assigned or assumed for these other factors in each case. At still a different level there would continue to be differences in judgments regarding proper policy because of differences in the relative importance attached to alternative policy goals.

In sum, forseeable developments in the analysis of cycles will undoubtedly improve our understanding of the processes involved. They will consequently

give us a better basis for the judgments underlying our recommendations in particular cases, but significant differences and uncertainties in judgment will undoubtedly remain. Policy recommendations will consequently have to continue to be adapted to such uncertainty, and studies of how this adaption can be made more effective must press forward along with the study of the cyclical process itself.

DANIEL HAMBERG: I should like to devote my discussion to two aspects of Professor Fels's interesting paper. One is the tasks of business cycle theory; the other is the emphasis given the caution of businessmen with respect to inventory accumulation in the postwar period in Fels's explanation of the limited magnitude of the 1949 recession. In the latter connection I shall suggest a hypothesis for expecting inventory recessions per se generally to be limited in magnitude and perhaps become even more so in the future.

A major task of business cycle theory is to explain why prolonged periods of growth are sometimes interrupted only by mild inventory recessions—recessions that do not degenerate into major depressions—while at other times the lapses from growth take the form of major debacles of the magnitude of those of 1872, 1892, or 1929. Closely connected with this task is the correlative one of explaining why some cyclical upturns rapidly cumulate into extended periods of full employment growth (with only minor interruptions), while others, like those of 1892 or 1933, are markedly lacking in vigor and buoyancy, either barely reaching or actually falling short of full employment before the upper turning point.

Many business cycle analysts endeavor to explain these differences by emphasizing a constellation of fortuitous circumstances that may be associated with the individual upper or lower turning points. Among this group may be numbered such writers as Professor Slichter and generally those that have written under the auspices of the NBER.

Along with many other cycle theorists, however, I would disagree with this type of explanation. In the main this disagreement probably stems from an innate desire to look for a more systematic explanation—to look for factors that all inventory recessions, for example, appear to have in common. The same kind of search is associated with the examination of the major downswings as well as with the effort to explain the broad differences in upswings mentioned earlier.

Analysis of the inventory recessions of the past has thus led many cycle theorists, those whom Fels describes as placing the emphasis on "long-run investment opportunities," to the observation that the common denominator of all of these recessions is a surging rate of innovational investment and, almost without exception, a similar behavior on the part of residential construction. (This fact leads me to discount somewhat the significance of the apparent upward shift in the consumption function in 1949 as a major explanation of the mildness of that recession. The recessions of the twenties were equally mild, without any corresponding behavior on the part of consumption.) At the same time, those downturns that cumulate into major depressions appear to coincide with the (temporary) drying up of these outlets

for fixed investment. Invariably, too, the aforementioned differential behavior in upswings following major depressions seems to depend on the presence or absence of major innovations and high volumes of residential construction.

In the realm of systematic explanations of business cycles, also, are the endogenous or self-generating theories, particularly those that employ a multiplier-accelerator mechanism or some variation of it, like the models of Hicks, Goodwin, Clark, Kaldor, and Kalecki. These and virtually all other self-generating theories, however, suffer from the fundamental defect of imputing to capitalism more instability than actually exists, and there is enough already. For in their basic features, as Professor Fels has suggested, they imply that all movements in national income, upwards and downwards, tend to be explosive or antidamped. Except through appendaged obiter dicta that change them in basic ways, these models are incapable of dealing either with inventory recessions or with those periods of temporary stagnation sometimes described as weak cycles.

The lone exception to this statement is the remarkable model of Professor Frisch, developed some twenty years ago. Modified to allow the erratic shocks of autonomous investment to vary in frequency according to the magnitude of the shock (the larger shocks occurring less frequently than the smaller ones), the Frischian model meets the long-standing objection that it lacks the characteristic of systematic fluctuation that seems to have marked the business cycles of the past (cf. M. Kalecki, *Theory of Economic Dynamics*, Chapter 13). The principal posers of this objection have been among those advocating the assumption of antidamped cycles. With the objection disposed of, there is no longer any reason to continue to assume a priori that such cyclical behavior constitutes the underlying tendency of capitalism. When the aforementioned modification of the Frischian model is made, fairly regular cycles are produced by models possessing heavy damping coefficients as well as those with moderately damping coefficients. From the viewpoint of cycle theory, this is an important point, for it is only a model with heavy damping coefficients and kept alive by the irregular behavior of autonomous investment that is able to cope in self-contained fashion with the task of explaining not merely the systematic aspects but also the *differential* behavior of business cycles.

The necessity of a concept of fluctuating autonomous investment, i.e., investment based on other than income change, is apparent. The resistance to such a notion, even conceptually, is strange, since it is clear that certain categories of investment can in no way be related to the sale of goods already being produced. Though such investment can be influenced in its timing by income level, the important thing is that this relation is unsystematic. Not only may autonomous investment not fall during certain downswing phases, thereby limiting the latter to inventory fluctuations, but it may not rise during some periods of cyclical upswing, giving rise to periods of temporary stagnation. At the same time, it may also fall in the face of rising income, leading inevitably (in the absence of appropriate government policy) to the major downswings like those experienced in the past.

If pressed for a generalized explanation of the origins of inventory re-

cessions, I would point to the many possibilities of industry or sector maladjustments that may arise in a free market economy using roundabout methods of production. Over- or underestimation of demand in certain sectors, or, perhaps more important, unforseen shifts in the composition of aggregate demand—all in the face of a certain amount of immobility of resources—these are the most likely candidates in looking for explanations of upper turning points. But when the aggregate economy has strength and resiliency imparted to it by the surging streams of innovational and residential investment, during those irregular periods of growth, it shows itself quite capable of absorbing these sectoral maladjustments within the limits of inventory recessions. When these autonomous investment outlets are more or less absent, the same maladjustments find the bottom dropping out of the private stream of expenditures.

With these remarks as background, I should now like to call your attention to factors that may be expected to make inventory recessions generally mild (so long as long-run investment opportunities are favorable). Professor Fels expresses a feeling of inadequacy with the emphasis given the apparent upward shift in the consumption function and the strength of autonomous investment in his explanation of the mildness of the 1949 recession. To bolster his argument he feels called upon to cite the comparative absence of inventory speculation in the period preceding the recession. His suggested reasons for this state of affairs are that businessmen remembered what happened in 1919-21 when they engaged in inventory speculation, that memories of the depressed thirties added to their caution, and that this caution was furthered by the predictions of postwar depression.

It is difficult to believe that the current crop of decision-makers would be significantly influenced by what happened in an inventory cycle some quarter of a century earlier. Most of them were either nonexistent as businessmen or were probably in very low echelon positions, and it is very likely that their knowledge of what went on at that time is quite dim. I find this suggestion just too implausible.

More seriously may we take the suggestions about the effects of the memories of the depressed thirties and of the predictions of early postwar depression. There is no time to discuss analytically the general merits of these suggestions. On the empirical side, however, the events of the postwar period appear to contradict such notions. In brief, Fels is suggesting that postwar business sales expectations were inelastic. Under these circumstances one should expect to find business investment concentrated in just that area where the turnover is rapid and where therefore funds would not be irretrievably tied up in the event of imminent depression. In turn, this implies that inventory investment should have played a dominant role in total investment, while fixed investment should have played a correspondingly minor role. This is just what occurred in the years 1919-20; but of course, exactly the opposite happened in the post-World War II period. For one observer at least, the latter fact—the fact that so much was spent on fixed capital especially—provides ample testimony that business expectations were quite elastic in the recent postwar period.

To what then can we trace the absence of inventory speculation in the postwar period? In answer, I would reply that this kind of behavior should be regarded as entirely normal, that it is the periods of inventory speculation that are exceptional and require special treatment. On the whole, economists have been prone to exaggerate greatly business propensities to speculate in inventories on future price movements. In contrast to this picture is the real one, which shows that businessmen generally have a strong aversion for inventory speculation. Most think in terms of making profits out of their essential business operations; i.e., their production and sales operations, the appeal of their (differentiated) products. Rather than engage in activity whose sole feature is speculation, businessmen generally prefer to concentrate their energies on affairs over which they believe they have more control, where their training and talents give them a greater feeling of security. In a basic sense, an element of speculation inheres in all roundabout methods of production or purchasing in anticipation of demand. But this is unavoidable. It does not mean that businessmen favor it. In fact, much business activity is best understood if viewed as efforts to reduce risk and uncertainty. By the same token, the implication is that businessmen will not go out of their way in quest of unnecessary risk and speculation, such as is involved in price speculation in inventories.

Good, conservative business practice frowns on pure speculative profits. Proper inventory practice "is said to consist in maintaining such a relation between output or shipments (or sales) as is required to support the normal functions of production and selling." (Abramovitz, *Inventories and Business Cycles,* page 184.) The reasons why businessmen look askance upon inventory speculation are manifold. For one thing, guesses as to future price behavior may prove wrong as well as right; the possibility of inventory losses may therefore stand on an equal footing with that of inventory profits. Inventories tie up cash balances; other things equal, they make a business firm less liquid and leave it more exposed to disaster through illiquidity. The threat of bankruptcy because of illiquidity is something to which every businessman is keenly sensitive. Moreover, if he has to borrow from a bank to finance inventory speculation, his banker will be suspicious and most likely uncooperative. It will be made clear to him that he is no longer regarded as a solid, conservative businessman, that his credit is no longer as good as it formerly was.

In addition, the businessman—manufacturer, wholesaler, or retailer—who engages in speculative inventory purchases must face the added costs incident to storage, handling, obsolescence, depreciation, interest, insurance, and possibly property taxes. His storage space may be absolutely limited.

These remarks are not intended to imply that business firms never speculate to any degree in inventories. Thus when sales are rapidly advancing, individual business firms may often be found to be building up inventories somewhat faster than the growing sales. Even this action, however, is likely to be motivated principally by the desire to ensure maintenance of the share of future markets; that is, protect against slow deliveries, poor selection, etc. At times, also, salesmen may tip off buyers of an impending price increase,

and the latter may respond by stocking up heavily in advance. Again, however, this may not reflect pure inventory speculation so much as it represents an effort to protect the business firm's competitive position. Pressures in this direction are likely to be especially strong if one's competitors are known to possess large stocks purchased at the lower prices.

Granting these possibilities as to "speculation," as a rule such cases do not represent the commonality of experience, such as might be expected to generate cyclical movements in GNP. The only important exception to this rule arises in connection with sudden developments like the Korean war or the wave of speculative buying following World Wars I and II. Under such circumstances, past experience, rightly or wrongly, may lead businessmen into efforts aimed at large-scale inventory build-up in anticipation of later shortages or high sales levels. However, the motivating force in this situation, too, is likely to be less a desire to cash in on high future prices than a fear of just getting stuck with little or nothing to sell. In any event, these circumstances may be assumed exceptional enough to warrant separate explanation. The behavior of businessmen under these conditions is not characteristic of their usual peacetime practice and will tend to give rise to mistaken results if applied in an analysis of inventory fluctuations of the kind experienced in the distant past, 1948-49, or even 1953-54.

The implications of the foregoing remarks should be clear. They suggest that "normally" inventory cycles as such may be expected to be mild. Violent inventory fluctuations like that of 1919-21 must be explained in terms of special circumstances. Thus Professor Fels's emphasis on the caution of businessmen as regards inventory investment during the postwar period must be taken to be misleading, for such caution is the usual earmark of business attitudes toward this category of investment. Instead, he might well rest his case on the stabilizing role of autonomous investment behavior, aided and abetted by the fortuitous upward shift in the consumption function.

In closing, I should like to offer a hypothesis that not only may inventory recessions per se normally be expected to be mild in character, for the reasons elaborated above, but that there is some reason to expect a secular growth in mildness; i.e., diminution in both amplitude and duration. Examination of the data on inventory-sales ratios leaves one with the strong impression of a secular decline in these ratios; the only important exception to this trend seems to be in certain areas of durable manufactures. A priori, there are many good reasons that can be offered in explanation of this apparent trend. One is the movement toward industrial integration—a movement that recently seems to have developed renewed impetus. Vertical integration may be expected to reduce inventory-sales or output ratios by lessening the instability of supply taking the form of variations in delivery rates and prices of materials. Horizontal integration may also have the same effect by reducing the amount of inventories held as safety allowances against unforeseen variations in supply and demand, "for deficiencies in one plant may be compensated for by excesses in other plants" (Whitin, *Theory of Inventory Management*, page 149).

Perhaps even more important in explaining the downward trend in inventory

ratios are the widespread improvements in transportation, communications, production methods, accounting control techniques such as IBM methods, and standardization of product. There is every reason to expect continued improvements in technology, etc., with their resulting tendencies to reduce inventory-output or sales ratios.

Now the general consensus on the role of inventories in business cycles is that on the whole they are destabilizing, even when cognizance is taken of their stabilizing function as shock absorbers. Much of the destabilizing effects of inventory investment may be associated with the inventory accelerator; i.e., the desired ratio of stocks to output or sales. Few, at any rate, are likely to quarrel with the statement that, *ceteris paribus*, the duration and amplitude of inventory cycles are likely to vary directly with the value of the inventory accelerator. Whence it follows that the secular decline in this accelerator may be expected to have a general damping tendency on inventory cycles.

But this is not all. Most analyses of the role of the inventory accelerator have been based on the assumption of a linear accelerator. Recently, however, modern inventory control methods have shown that optimal inventory policy dictates that inventories should vary less than proportionately with changes in sales (see Whitin, *op. cit.*, Chapter 3). Introduction of such a variable accelerator also has a decisive damping effect on inventory fluctuations (see *ibid.*, pages 121-124). Contrary to the opinions of most economists on this matter, there is some evidence that many businessmen at present plan their inventories to behave in this manner, though for a variety of reasons. In part, this may account for the mildness of some of the recent inventory recessions. Beyond this, however, as modern inventory control methods attain wider use and more and more businessmen see the wisdom of varying inventories less than proportionately with sales, there is a further basis for expecting future damping in inventory cycles.

Finally, I should like to draw attention to what seems to be a trend away from FIFO in favor of LIFO accounting systems. To the extent that there exist any propensities to speculate in inventories, this switch should tend to reduce them. For the profits on inventory that arise during periods of advancing prices are wiped out under LIFO bookkeeping methods.

One final word in self-defense. My statement, quoted by Professor Fels, to the effect that the inventory recessions of the past testify to the stability of capitalism should not be misconstrued. It was made with those models in mind that indicate explosive behavior following all turning points. From the point of view of policy recommendations, I quite agree with Professor Fels that there is no basis for inferring from the 1949 and other similar experiences that major downswings are a thing of the past, as there is evidently some tendency to do currently. This view, however, is perfectly consistent with the notion that not all upper turning points may be expected to degenerate into major downswings—so long as there continues to exist an important category of investment that is independent of income change. The link between these seemingly opposing views lies in the fact that we do not as yet have tools that enable us to know in advance when there is a sufficient volume of "long-run

investment" outlets to limit downswings to the magnitude of inventory recessions and when there is not. But this is a problem of forecasting, not theory. Nonetheless, as long as our forecasting techniques remain weak, I for one would recommend policy based on the cautious assumption that any upper turning point poses a threat of major depression.

EARL C. HALD: Professor Roose has given us a concise summary of business cycle developments in the United States over the past several years. Much of of his analysis and most of his conclusions would seem to require nothing from me but expressions of hearty approval. I particularly welcome the note of caution he employs in surveying the future—a note that needs to be sounded for the benefit of those who, dazzled by the gyrations of the stock market and delighted to find that the production of steel at 75 per cent of capacity is still a highly profitable operation, are saying that the 1954 recession has been only a slight hesitation in the onward march of prosperity and high employment. Apart from, and yet affecting, the outlook for the future, certain aspects of the 1952-53 boom and of the 1953-54 slump may be worthy of more comment and analysis than could be brought to bear by Professor Roose within the limitations of his paper.

Pointing out that consumption rose by 14.1 billion dollars (at annual rates) from the second quarter of 1952 to the second quarter of 1953, and that investment rose by 8.7 billion dollars during the same period, Professor Roose says: "The dominant factors in this boom clearly were consumption and gross private investment." Although the importance of the increases mentioned was obviously great, one may question the omission of a reference to government spending for goods and services, which rose by 8.5 billion dollars during the same period, or almost as much as investment gained. It seems clear that this increase in the government portion of the spending stream substantially affected the character of the boom, just as the fall in government spending during 1954-55 has been of significant, if not dominant, importance during this latter period. As for the rise in consumption in 1952-53, it should be pointed out that consumption as a percentage of disposable income actually fell during the 1952-53 boom, personal saving having risen from 7.3 per cent of disposable income in the second quarter of 1952 to 7.8 per cent in the same quarter of 1953. (It is interesting to note that the proportion of disposable personal income saved continued to rise throughout the third and fourth quarters of 1953 but has fallen rather sharply in the second and third quarters of this year, coincident with the leveling out of the slump.) On the basis of these data it would perhaps be more accurate to say that the character of the 1952-53 boom was shaped primarily by government spending and private investment and much less by consumption spending.

Professor Roose comments only in passing on what is to me one of the most interesting aspects of the 1953 downturn; namely, the part played by monetary policy, as reinforced by Treasury interest rate policy, early in 1953. The focus on monetary policy has been sharpened by statements made lately, on the one hand, by its defenders to the effect that the easing of credit conditions beginning in May, 1953, saved the economy from a more severe depres-

sion and, on the other hand, by its critics that the tight money policy of early 1953 caused all of our troubles, and therefore the monetary authorities should not now be reminding us of how fortunate we are that conditions did not become worse than they actually proved to be! On this subject, Professor Roose merely points out that, judged by the behavior of the price level, the major inflationary boom had terminated well before 1953 and that therefore the decision to permit credit tightness to continue and even to be accentuated early in that year seems "neither necessary nor wise."

Needless to say, the part played by monetary policy in shaping the course of events during any period is extremely difficult to assess. This is partly because the real impact of monetary policy may not be manifest in the behavior of interest rates, which can be observed, but may appear in that obscure and indefinable area we call the availability of credit. Moreover, we must think of monetary policy also in terms of its indirect influence on the expectations of both entrepeneurs and consumers—not to mention the expectations of bankers, which may be of equal importance. In assessing the reasonableness of monetary policy early in 1953, however, we may begin by pointing out that, although the rise in wholesale prices had reached a peak early in 1951 and there had been some decline through June of 1952, the picture during the remainder of 1952 and early 1953 was by no means a clear one, and both wholesale and retail prices showed stability and at times even a rising tendency during the first three months of 1953. In view of all the indicators at hand, perhaps the conclusion of the monetary authorities that the inflation potential was still present is understandable.

There is little evidence that Federal Reserve authorities actively desired to tighten money rates in the spring of 1953. It is true that the rediscount rate was moved up from 1¾ per cent to 2 per cent in January, but this may be explained in part by the fact that the lower rate had been in effect for more than two years during a period of rising market rates and that the Federal Reserve authorities simply felt it was getting too far out of line with market rates. Moreover, the announcement of the rate increase just before the accession of the new administration to power implies perhaps more than anything a desire to dissociate this change, which had been contemplated for some time, from the policies of that new administration, which had already been revealed to be in favor of higher money market rates. After January, Federal Reserve ownership of government securities remained virtually unchanged until May, when an active program of open market purchases was inaugurated. Reserve requirements were permitted to remain at the levels which had prevailed for two years. It would appear proper to describe the policy followed by the monetary authorities throughout February, March, and April of 1953 as one of watchful waiting, after which a decision was taken to embark upon a policy of definitely easing credit. Meanwhile, the increasingly strong demand for credit continued to push market interest rates upward, the peak as measured by the prevailing rate on long-term government securities being reached in the first week of June.

How large a part was played by Treasury policy in the rise of interest rates between January and June is of course impossible to say. It is only fair to

point out, however, that there was a great deal of talk, both publicly and privately, to the effect that Treasury officials of the new administration were determined to convert at least part of the maturing debt into securities of much longer term, and that they were aware that this would require an interest rate structure higher than had heretofore prevailed. It is my belief that this announced policy had a good deal to do with the reaction of the money market, and that to the extent that the interest rate pattern of this period was due to government policy action, the blame or credit, as the case may be, must attach to the actions of the Terasury as much or more than to the actions of the monetary authorities. One might even go so far as to suggest that the tendency of the Treasury to "run with the ball," so to speak, resulted in such a sharp rise in interest rates that the monetary authorities soon came to the conclusion that credit stringency was developing too far and too fast. I have a strong impression that this course of events had much to do with the decision by the monetary authorities to reverse the trend of credit developments earlier than might otherwise have been the case. It is ironic that the Federal Reserve authorities, having striven for a full seven years to inaugurate a more restrictive interest rate policy in the face of determined and for the most part effective Treasury opposition, suddenly became faced with the opposite situation: a Treasury policy which now became too restrictive too rapidly. The result, thus largely fortuitous, was that the monetary authorities were able to establish a record of reversing monetary policy at the peak of the boom much earlier than they had succeeded in doing at any other point in history.

Unfortunately, much of this commentary must remain in the realm of speculation. The only thing that we can say definitely from the facts as they emerged is that the monetary authorities avoided overtly adding to credit stringency during a three-months period near the very end of the boom, and substituted for this essentially neutral policy a policy of active credit ease well in advance of any real evidence that the downturn was at hand. It may well be that the least fortunate result of the general rise in interest rates during the first half of the year was that growing scarcity of funds available for federally guaranteed mortgages resulted in a rise in interest rates in this area. This not only confused the picture as to whether the government was seeking to raise interest rates generally or to lower them, but may represent a substantial long-term cost to such borrowers, since the higher rate has remained in effect in spite of easier money market conditions. From the standpoint of its impact upon spending as a whole, however, the effects of the change in mortgage rates do not appear to have been serious, since construction has remained remarkably strong.

Monetary policy since mid-1953 requires little comment, the Federal Reserve System having followed an active policy of easing credit by means of reduction of reserve requirements, purchases in the open market, and two reductions in the rediscount rate. The extent to which these policies have contributed directly to the leveling out of the economic decline since earlier this year is of course uncertain; but the actions taken have at least been conducive to recovery.

With regard to the longer run, it appears to me that Professor Roose's questions concerning our ability to maintain high level employment, in view of our increasing labor force and of improvements in productivity, are well founded. Those who look to private investment for the necessary increases in the spending level are likely to be disappointed. Aside from inventory changes, gross private domestic investment has been remarkedly stable over the past three years—and remarkably high. Although we have been experiencing an unusual period of rapid technological advance and very high construction, it does not seem reasonable to expect these factors to expand further rapidly enough to take up the slack. Consumption, as Professor Roose has pointed out, could not be expected to provide much of the required increase, even if we assume a substantial drop in the rate of saving. With these points in mind, one might raise a serious question as to the efficacy of this year's tax reduction program, so largely based on the "trickle down" theory of demand stimulation.

The remaining factor is therefore government spending, whose sharp decline in the past year has so vitally affected aggregate demand. To the extent that world conditions permit a reduction in defense expenditures, it might be useful to think in terms of government spending for such items as highways rather than a further reduction in over-all government expenditures. Under present conditions with respect to revenue, this would raise the familiar question of the trend of public debt—surely too complex a question for our present limited discussion.

DEBT MANAGEMENT AND MONETARY POLICY

FEDERAL DEBT MANAGEMENT: CIVIL WAR, WORLD WAR I, AND WORLD WAR II

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The tools of public debt management used in each of our major wars fall into three broad categories. First, the government has created securities in a variety of forms. The interest rates, maturities, conditions for call or redemption, and other special provisions (including taxability) have been adjusted to fit various requirements. Second, the government has, to some extent, manipulated the market. In some cases this has simply been an advertising program, but more frequently it has been a high-pressure campaign playing on the emotional tension of the times. More important in recent years have been the somewhat mechanical techniques for rigging and underwriting the market. Third, the government has used powers of compulsion ranging from the thinly veiled threats of quotas to the declaration that certain of its securities are legal tender (i.e., money).

A variety of objectives have guided the use of these tools. Most economists have urged the debt authority to use them primarily as weapons for the control of inflation.[1] But the debt authority is also asked to finance large deficits without paying excessive interest costs, without establishing "unmanageable" postwar debt structures, without treading too harshly on our concepts of free markets, and without injuring the future ability of the government to borrow. The result has generally been a series of compromises, with service first to one then to another objective. As a result none of the goals has been fully achieved, nor completely disregarded.

The Civil War, World War I, and World War II did not impose equal burdens on the debt authority. Some indication of the different magnitudes of the financing problem is shown by Table 1. In terms of the diversion of resources to war, World War II was about four times as costly as World War I. The share of war costs financed by taxation in the Civil War was about half that of World War II. Furthermore, variations in the length of the war emergency, the degree of popular support for the war, the characteristics of the monetary system, and the distribution of the tax burden also influenced the magnitude of the

[1] The lack of unanimity among economists on this issue probably stems largely from disagreement on the desirability of direct controls. Faith in the effectiveness of direct controls for controlling inflation (plus, in some instances, a hope for a moderate degree of inflation) encouraged emphasis of other objectives, especially in World War II.

task of the debt authority. Nevertheless, in each of the wars the Treasury was faced with the task of channeling to itself large amounts of money in short periods of time. This pressure to maintain a rapid flow of funds is a distinguishing characteristic of wartime debt management. The following discussion of debt management practices examines some of the things the Treasury has done to meet this pressure.

Marketing the Securities. In each of the wars advertising campaigns stressed the patriotic duty of citizens to buy bonds, and in many cases the appeal to unsophisticated investors was based on a presumed need for funds for specific purposes ($18.75 will buy a grenade for our boys). The organization developed by Jay Cooke during the Civil War established the general pattern used in subsequent campaigns. Relying primarily on banks and other financial institutions as the focal points for local committees, he brought the sales message to every community. With the development of mass communication media and more scientific methods of calculating quotas, sales policies became more centralized but the core of the sales program has remained a voluntary "grass-roots" approach.

In wartime, the need to sell government securities to groups unfamiliar with investing requires that efforts be made to simplify the process. "Three will get you four in ten years" was one way to simplify the idea of compound interest. It was probably only exceeded in its simplicity by the "two cents a day" slogan which was used to sell the 7.3 per cent notes of the Civil War. Similarly, smaller denomination

TABLE 1

FEDERAL WAR EXPENDITURES, DEBTS, AND RELATED DATA

(Amounts in billions)

	Total Federal War-time Expenditure	Percentage of Federal Expenditure Financed by Taxation	Increase in Federal Debt Over Last Prewar Year		Estimated Gross National Product for Years Shown*	Percentage of Gross National Product*		
			Amount	Percentage		Total Federal War Expenditures	War-time Debt Increase	Interest Charge on Federal Debt
Civil War....	$3.3	21	$ 2.6	4000	$ 6 (1865)	54	43	2.3
World War I..	33	30	24.3	2000	77 (1918)	43	31	1.4
World War II.	368	42	229.2	550	215 (1945)	171	107	2.3

* GNP estimates for 1918 and 1865, designed to be comparable with the Department of Commerce concept used for 1945, were made with the assistance of Daniel Holland and Daniel Creamer, of the National Bureau of Economic Research, and are based on unpublished estimates made at the National Bureau of Economic Research.

SOURCE: *Annual Reports of the Secretary of the Treasury.*

securities have been offered to persons with low incomes. The development of the saving stamp scheme during World War I was the logical development of these efforts. The "withholding" program of the payroll savings plan of World War II was another such step designed to simplify and widen the distribution of government securities.

Preventing the Postponement of Bond Purchases. One obstacle to the sale of bonds during wartime is the reluctance of persons to invest because they expect bond prices to fall as the war continues. In October, 1942, this attitude apparently contributed to the near failure of at least one bond offering. But for the rest of the war the problem was eliminated by the clear understanding that the Federal Reserve System would protect the yield curve existing at the beginning of the war.[2] In World War I the Treasury had used the conversion privilege on the first two Liberty Bonds, saying, in effect: if bond prices fall, holders will be able to turn in their old bonds at par for any new bonds with higher coupon rates. By placing certain time limitations on the right to convert, by changing the tax-exemption privilege, and by naming the last loan a note instead of a bond, it restrained some of the conversion. Nevertheless, two-thirds of the convertible bonds eventually ended up in a form which dissipated the potential savings of the early low interest rates.

The Interest Rate "Trade." When upward pressure on interest rates becomes strong, the Treasury can relieve it by monetizing a portion of the debt. Later comments will show that the Treasury has made considerable use of this safety valve. But this is not the full extent of its efforts. It can also vary the security package by offering other types of yields.

Tax exemption has been the nearest alternative to the reward of higher interest rates. It was not used during World War II—except for the *de facto* exemption given to some holdings of savings bonds.[3] In the Civil War, tax exemption was probably not especially effective in in-

[2] The serious problem of postponed bond subscriptions was eliminated, although not everyone fully believed that the pegs would hold. The doubters were a good market for short-term, low-yield securities and, as Paul Samuelson put it, "the gullibility of investors" yielded a benefit to taxpayers. See his, "Turn of the Screw," *Am. Econ. Rev.*, September, 1945, pp. 674-676. Without this uncertainty the pegs probably would not have held. An interesting discussion of the disequilibrating effect of certainty in a supported market is found in Elinor Harris, "Money Demand and the Interest Rate Level," *Quart. Jour. Econ.*, February, 1950, pp. 105-124; also "Comment" and "Reply," *Quart. Jour. Econ.*, May, 1951, pp. 284-289.

[3] Since the large mass of holders of E-Bonds probably do not report the interest in their income tax return they may be considered, in effect, tax-exempt issues. For the same reason many savings deposits, savings and loan shares, and other widely distributed financial assets may also be considered tax exempt. However, it seems doubtful that this type of exemption was important to the people (small investors) who received it. Of course, if the Treasury had, at the time of sale, pledged a stronger enforcement of tax reporting for E-Bonds than other exempt assets, the attraction of E-Bonds would have been weakened.

creasing the demand for securities. The maximum income tax rate was only 5 per cent; so that at best the difference in yield was minor. More important, though, the exemption feature was not especially attractive because it was written into the revenue law instead of the security itself: it was only as good as the current revenue law.

Tax exemption was an important variable during the first World War. After the First Liberty Loan (which was fully exempt except for estate and inheritance taxes), a variety of exemption provisions were used. In the second and third loans, the Treasury increased the rate of interest and reduced the degree of tax exemption—partly in order to obtain a wider distribution of bonds with persons of moderate means and partly to prevent complete conversion of the first Liberty bonds. In the Fourth and Fifth Liberty Loans, the Treasury, attempting to halt the increase in interest rates, used one of the most interesting tax-exemption features known. This was the carry-back tax exemption through which, depending on the amount of fourth or fifth Liberty bonds held, additional tax exemption could be obtained on other Liberty bonds held. In other words, by purchasing the new bonds, investors could get tax exemptions for some of the previously taxable securities.[4]

In all of our wars, the government has attempted to substitute the appeal of patriotism for the appeal of high yields, but in none has there been as frank a recognition of this trade between better yields and patriotism as in World War I. Indeed, the excesses committed in the name of the war effort during World War I probably account in large part for the somewhat more relaxed approach used during World War

[4] The sequence was as follows (variations in exemptions applied only to graduated income and profits taxes):

First Liberties (3½%)—Exempt in unlimited amounts.
Second Liberties (4%)—Interest from $5,000 principal exempt
Third Liberties (4¼%)—Same as Second Liberties but total exemption from Second and Third Liberties could not exceed $5,000.
Fourth Liberties (4¼%)—Same as Third Liberties but total exemption from Second, Third, and Fourth Liberties could not exceed $5,000.
Except: (1) $30,000 of Fourth Liberties were exempt until two years after the war and (2) an additional amount of Second and Third Liberties equal to 1½ times the holdings of Fourth Liberties (but not over $45,000) were exempt for the same period.
Fifth (Victory) Notes
4¾%—No tax exemption.
3¾%—Exempt in unlimited amount.
In addition, Second, Third and Fourth Liberty bonds equal to three times the holdings of Victory Notes (but not over $20,000) were exempt.

Thus, in addition to the exemption of unlimited amounts of the First and Fifth (3¾ per cent series) loans, purchasers could also obtain exemption on $100,000 of Second, Third, and Fourth Liberty bonds, largely by the carry-back exemption. For a short description of the carry-back exemption, see Robert A. Love, *Federal Financing* (Columbia University Press, 1931), pp. 178-180; some Treasury reasons for this type of exemption are given in a letter reproduced in the *Annual Report of the Secretary of the Treasury* (1918), pp. 14-17.

II. The social pressure of patriotism coupled with quotas can be a ruthless and discriminatory device—especially for the economically insecure.[5] The official disapproval of coercive patriotism during World War II can be contrasted with the statement, attributed to Charles G. Dawes, then chairman of the regional sales campaign, when someone expressed doubt that a 3½ per cent interest rate was high enough: "Anybody who declines to subscribe for that reason, knock him down."[6]

But if patriotism as a substitute for interest payments was deemphasized in World War II, its place was more than filled by another feature: liquidity. If money is defined in terms of the two attributes of standard of value and medium of exchange, there is a clear demarkation between money and debt. However, when stress is put on the first attribute and its subcharacteristics—a store of value and a bearer of options (the stress indicated for contingency and speculative balances)—the distinction between money and debt becomes hazy. Assets of the hazy type are ordinarily labeled liquid assets; their price in terms of the accounting unit is regarded as given but they cannot be spent. Debt management during World War II resulted in the creation of a large volume of such assets. In addition, assets were created which, though they lacked contractual stability in price, offered only minor prospects of variation and therefore only slightly less liquidity.

The nearness of the federal debt to money was fostered not only by the support program and the issuance of redeemable securities but also by emphasis on marketable short-term securities. Thus investors who were unconvinced of the tenacity of the support program and who were legally limited to a given amount of savings bonds could still find an ample volume of liquid securities in the short-term market. Table 2 shows this greater emphasis on short-term issues during World War II.

With an upward sloping yield curve, the stress placed on short-term securities resulted in a substantial interest savings. In other words, the Treasury also "played the pattern of rates." But this source of Treasury economy does not appear to have been available in our earlier

[5] See Henry C. Murphy, *National Debt in War and Transition* (New York, 1950), pp. 86-87. Murphy notes that there was probably much coercion in bond sales during World War II. But the effect on the bondholder was, at worst, only temporary because he could get back at his oppressor by selling or redeeming his bond without a loss. In this he was better off than the bondholder in World War I, who in most cases would have had to sell his bond at a loss.

[6] Quoted in C. J. Childs, *Concerning U. S. Government Securities* (Lakeside Press, 1947), pp. 119-120. The idea of a trade between interest rates and patriotism runs through many Treasury releases during this period. For instance, referring to the last Liberty Loan, Secretary Glass said: "Some students of the situation believed it would be impossible again to appeal to the patriotism of the American people. The Treasury held no such view. Furthermore, it was impossible to float the loan strictly on a commercial basis." *Annual Report of the Secretary of the Treasury* (1919), p. 33.

wars. The yield curves during World War I and the Civil War are not clearly defined, but they seem to have been virtually flat throughout the war; hence little interest saving was to be gained by using short-term issues.[7]

Although short-term obligations have been used in all of the wars, they were not generally considered respectable before World War II. In World War I, Treasury certificates were generally issued in anticipation of taxes or bond subscriptions. They were used for later payments to the government and were never really considered a permanent part of the debt. In the Civil War, the substantial use of three-year notes (and bonds callable in five years) was rationalized by the Treasury as a means of retaining control of the debt. Interest rates were expected to decline and the government was expected to retire some of the debt in the postwar period; hence it was deemed desirable that a portion of the debt be subject to refunding. Nevertheless, the objective at the time was still to refund the short-terms into long- and this was done shortly after the war. On the other hand, the greater emphasis during the thirties of the liquidity needs of financial institutions and nonfinancial corporations led to greater acceptance of short-terms and

TABLE 2

MATURITY DISTRIBUTION OF INTEREST-BEARING DIRECT FEDERAL DEBT*

(JUNE 30, 1865, 1919, DECEMBER 31, 1945)

Term to Redemption or Maturity	Percentage of Total		
	1865	1919	1945
Demand†	4	4	22
Less than 1 year	7	14	27
1 year and less than 5 years	40	0	8
5 years and over	49	82	43
	100	100	100
	Amount in Millions		
Total interest-bearing direct federal debt*	$2,217	$25,234	$237,545

* Excluding special issues held in Treasury trust accounts.

† Includes issues which possess a definite maturity date, e.g., savings bonds or notes, but which are payble upon demand of holder.

[7] In World War I, the basic yield curve for high-grade corporate securities was flat in the first year of the war and slightly downward sloping to the right in 1918 and 1919. See David Durand, *Basic Yields of Corporate Bonds 1900-1942* (National Bureau of Economic Research, Technical Paper, No. 3, 1942), p. 5. Since the spread between corporate and government securities probably varied from time to time and for different maturities, this yield curve is only a rough approximation of the government's curve. A sampling of government security yields during the Civil War suggests the same thing: a flat curve with a slight tendency toward higher yields for short-terms.

permitted them to play a permanent part in the "tailoring" program of World War II.

Maintaining the Prices of Government Securities. The problem of maintaining the prices of outstanding securities can be evaded through the use of fixed price, demand obligations such as the Series E bonds used during World War II, the War Savings Certificates (which were redeemable upon ten days' notice) used during World War I, and the Temporary Deposit Certificates (redeemable on ten days' notice) used during the Civil War.[8] Such demand obligations were only used to a minor degree in World War I and the Civil War. But in financing World War II, against a background of uncertainty caused by the depression, it apparently seemed unlikely that anything less than a completely safe security could attract a large volume of small savers' funds. Thus fixed price obligations accounted for over one-fifth of the World War II debt.

The efforts of the debt authority to maintain prices of government securities in the market have received considerably more attention than these contractual agreements to pay a given amount on demand. Manipulation of the prices of outstanding securities is a familiar technique of bond sellers—and the Treasury is no exception. When the Treasury is able to hold the market prices of existing securities at or above their issue price, two results are achieved. First, it prevents the investor from finding better, cut-rate securities on the open market, and, second, it indicates to the public that the purchase of a government security will not involve a direct capital loss. In this regard the support program of World War II was clearly a success.

In contrast to World War II, the support operations of our earlier wars were crude and ineffective. In the Civil War, the Treasury commissioned its agent to enter the market on several occasions to purchase issues which, because of their low prices, were discouraging the sales of current offerings. The largest of these support operations involved only 10 million dollars and apparently took only the biggest bargains off the market. They were solely emergency operations designed to deal with specific market situations and the authority to purchase securities was never continued for more than a month or two at a time.[9]

[8] The Temporary Deposit loan of the Civil War was an interesting excursion by the Treasury into the banking business. These deposits, made at the subtreasuries, paid 4, 5, and 6 per cent interest at various times. Virtually on a demand basis, they were attractive to banks and other financial institutions for investment of short-term funds. The certificates ultimately came to be used by city banks for settling clearing house balances. In the type of funds they attracted and the way they were used they were similar to the Treasury bills of World War II.

[9] An interesting source of price support existed with the gold bonds of the Civil War. Since the market price of gold rose at almost the same rate as the general price level, bondholders receiving interest in gold and a pledge of redemption in gold had what amounted to a "purchasing power bond." The price of gold bonds reflected this by stay-

During the first World War, several devices were used directly to support the prices of government securities. Beginning with the Third Liberty Loan, the Treasury was authorized to set aside 5 per cent of the proceeds of new bond issues for the purpose of repurchasing securities, the maximum price to be paid for these securities was par plus accrued interest, and the securities purchased were to be canceled and considered retired. In the first six months in which this program was in effect the Treasury purchased close to 250 million dollars worth of Liberty bonds and by November, 1919, it had purchased 953 millions.

This type of support operation was, in effect, simply a preliminary repayment of the portion of the loan which appeared to be excessive (excessive being defined as that marginal amount of the loan which tended to depress the market price below some predetermined level). It meant that the Treasury had to borrow more funds in other loan drives or concurrently sell some other type of security. In a period of rising interest rates, it meant that the Treasury was in effect refunding a portion of the outstanding debt at higher interest rates.

Repurchase of Treasury securities was also made possible in World War I by the establishment of the War Finance Corporation (WFC). This agency obtained most of its funds from the Treasury and purchased government securities for its own account and then later sold them to the Treasury. Since WFC held 487 millions in November, 1919, the total amount purchased by the Treasury by that date was 1.43 billion, or 5.8 per cent of the war debt.

This "by its own bootstraps" operation, in which the Treasury used mainly borrowed funds for the purpose of buying its own securities, was not wholly successful if the maintenance of prices at par is taken as the criterion. Except for the First Liberty Loan, each of the Liberty bonds fell below par from the first time they were traded and gradually moved down in price for several years. But, obviously, par need not be taken as the sole measure of success, since we have no way of knowing how far prices might have fallen without these operations. It is interesting to speculate, however, whether the government would have

ing above par, but the full impact of the inflation never showed in bond prices. If it had, bond prices should have increased with increases in the price of gold. (To maintain a constant yield the price of a gold perpetuity would be a constant multiple of the price of gold.) Since increases in the price of gold were also interpreted as indications that the government might not continue to pay in gold, a prospective purchaser could not view the bond as a pure purchasing power bond. Nevertheless, for those persons who bought them at par and held them through the inflation they were almost as good. Interesting comments on this aspect of the Civil War gold bonds are found in Wesley Clair Mitchell, *History of the Greenbacks* (University of Chicago Press, 1903), pp. 275-279, 377-378; also, Frederick R. Macaulay, *The Movements of Interest Rates, Bond Yields, and Stock Prices in the United States Since 1856* (National Bureau of Economic Research, 1938), pp. 201-203.

helped itself more if it had sold 1.5 billion dollars fewer bonds and forgotten all about trying to support prices.

The pressure of declining security prices intensified as the war progressed and in the initial version of the Fourth Liberty Loan Act the ultimate solution was offered: a provision giving the President the power to prohibit the transfer of bonds on the market. After much debate, the provision was softened so that the President could simply investigate and regulate sales. Apparently scant use was made of the power to subpoena books and testimony, but there is ample evidence that the Treasury employed its powers of persuasion in the market place. Treasury Department statements made it quite clear that the government considered bond buyers as patriots and people who sold their bonds were frequently the opposite—although they were never quite called traitors. In contrast with these sometimes tortured devices of World War I, the simplicity of the support program of World War II seems almost benign.

Monetization of Debt. In a sense, the amount of the debt which spills over into the monetary system is a measure of the effectiveness of all the rest of the debt management policies. That is, the monetized debt may be considered a residual: what is left over after other sales efforts had been used. The public record clearly shows that our wartime debt authorities have regarded monetization of the debt in this way; they considered monetization to be undesirable and they attempted to avoid it. But it is important to recognize that the other residual market (remaining nonbank funds) still existed and could be tapped with the residual tools—greater sales efforts, higher interest rates, more tailoring, or further effort with any of the other flexible sales weapons. The fact that these other tools were not used suggests that monetization was considered a more flexible, more certain, or less costly tool than the others.

In World War II the approach was fairly simple: the objective was to sell as many securities as possible, with the weapons used, outside of the banking system and then to sell the balance to the banks.[10] In order to perpetuate this arrangement, the Federal Reserve System and the Treasury developed the support program. And to further implement the program they employed a new tool of war finance: the yield curve. With this ingenious device, deviations from

[10] In a formal sense, only purchases by the central bank are inflationary. Sales of government securities to commercial banks do monetize the government debt, but if the supply of reserves is given, government debt is simply substituted for private debt. However, when the central bank keys its purchases (or advances) to commercial bank purchases, i.e., more commercial bank purchases result in more central bank credit, then sales to banks are inflationary. Since commercial banks had and used the privilege of shifting securities to the central bank during each of the world wars, sales to them are considered inflationary here.

the normal yield curve were the trigger mechanism for the creation of new bank reserves. From the standpoint of simplifying the task of debt management, this program was a major advance in war finance. It permitted the Treasury to develop a basket of securities which bore certain well-defined characteristics and to use these same securities with minor changes for the duration of the war. In contrast, the securities of our other wars had been continuously sprinkled with a variety of special "this time only" provisions.

As shown in Table 3, the Reserve banks purchased close to 9.6 per cent of the debt of World War II. In World War I they had purchased only about 1 per cent. But whereas Reserve bank loans secured by government securities were only 0.1 per cent of the new debt in World War II, they were equal to 6½ per cent of the debt of World War I. Thus Reserve bank credit on account of government securities amounted to 9.7 per cent of the World War II debt and 7.4 per cent of the World War I debt.

In World War I, a preferential discount rate on notes secured by government securities was the major device employed to expand Federal Reserve credit; in World War II open market operations accomplished the same thing while at the same time registering distinct price quotations in the government security market. These means used to expand Federal Reserve credit reflect the prevailing theories of monetary controls. In 1917 the discount rate was the core of Federal

TABLE 3

BANK CREDIT AND FEDERAL DEBT, WORLD WARS I AND II

(Amounts in billions of dollars)

	WORLD WAR I June 1916–June 1919		WORLD WAR II June 1941–Dec. 1945	
	Amount	Percentage of Total War Debt	Amount	Percentage of Total War Debt
Total war debt	$24.26		$229.15	
(1) Increase in government securities owned by Federal Reserve banks	.24	1.0	22.01	9.6
(2) Increase in government securities owned by commercial banks	4.39	18.1	70.70	30.8
(3) Increase in Federal Reserve loans secured by government securities	1.55	6.4	0.22	0.1
(4) Increase in commercial bank loans secured by government securities	3.0*	12.2	6.0*	2.6
War debt financed by bank credit (1+2+4)	7.6	31.3	98 7	43.0

* Estimated on the basis of reporting member banks.

SOURCE: Board of Governors of the Federal Reserve System, *Bulletins, Banking and Monetary Statistics, Annual Reports.*

Reserve policy; open market operations as a means of influencing the volume of credit were still to be invented. In 1941 the situation was reversed; open market policy was considered paramount and the discount rate was regarded largely as a psychological tool.[11]

About one-third of the debt created during each of the world wars was financed by commercial bank credit. In the second World War the banks purchased 31 per cent of the new debt for their own portfolios and carried an estimated 3 per cent by loans to customers. In World War I, the banks purchased only 18 per cent on their own account and extended loans to customers for approximately 12 per cent more of the war debt.[12] Financing of the deficit by commercial bank credit can be roughly set then at 30 per cent in World War I and 34 per cent in World War II.

In World War I a greater share of the new reserves was used to extend credit to customers under the "borrow and buy" program. This, of course, was more in keeping with the then prevailing ideas of banking. The customer loan was considered more liquid than the security which it purchased. By World War II, banks had become accustomed to larger government portfolios; new means of liquidating securities had been developed; a bank could afford, therefore, to invest more heavily in governments. The fact that the Treasury provided a stable market and a host of varying maturities, enabling a bank to pick its liquidity risk, was clearly more conducive to direct holdings than the emphasis on illiquid long-term securities of World War I.

A comparison of the monetization of the debt in the world wars with that of the Civil War shows the contrast between types of monetary systems. The first Civil War loan, which was taken by a group of large banks, contributed to the suspension of gold payments by the banks and eventually by the Treasury. Into this monetary vacuum the Treasury issued its first series of greenbacks: legal tender notes.

[11] Anna Youngman suggests a number of factors which may account for the shift in techniques: the development of the tradition against borrowing and Federal Reserve disapproval of borrowing as a long-run source of reserves, the excess reserve episode of the thirties, and bankers fear of being trapped, as they were in 1920, by rising discount rates. See her *Federal Reserve System in Wartime* (National Bureau of Economic Research, Occasional Paper No. 21, 1945), pp. 26-29. Of course, banks were trapped in 1920 by a reversal in Federal Reserve policy. And the same thing could have happened following World War II if open market policy had been reversed.

[12] Two points have been raised about the customer loan data: (1) some customer loans secured by government securities may have been used to finance purchases other than government securities; (2) some government securities may have been purchased with loans secured by personal notes or other collateral. Regarding the first, such borrowers had a choice of selling their bonds or borrowing new funds; since they chose to borrow, banks did, in effect, finance their bondholdings. As for the second, there may have been a small amount of such lending, especially where customers already had established a line of credit; but the preferential borrowing rate generally accorded to loans secured by governments undoubtedly kept most such bank credit in the "secured by government obligations" classification.

Subsequently, the issues of greenbacks, demand notes, and fractional currency rose to nearly 460 million dollars, or about 17 per cent of the total war deficit. In addition, the Treasury also issued over 225 million dollars of one-, two-, and three-year legal tender notes which paid 5 per cent and 6 per cent compound interest. The 5 per cent notes bore coupons which could be clipped, eliminating any interest accrual.[13] They were therefore widely used as currency. The three-year compound interest notes were an attempt to correct this situation by allowing interest to accrue for the whole period to maturity (after three years a $100 note had a redemption value of $119.40). Approximately 8 per cent of the war deficit was financed by this interest-bearing legal tender.[14] In addition, by June 30, 1865, the national banks held 392 billion dollars in government securities of which 236 million was held on deposit with the Treasurer of the United States. Data on state banks' holdings of government securities are not complete but they probably did not exceed 25 million dollars by the end of the war. Altogether, then, it appears that national and state commercial banks absorbed about 15 per cent of the war debt.

These three categories of Treasury issues—legal tender notes, interest-bearing legal tender notes, and securities sold to the commercial banks—account for about 40 per cent of the wartime deficit. Thus in terms of monetization of debt, the Civil War falls in between the two world wars. However, because Civil War taxing policy was less vigorous, the monetized debt played a larger role in over-all fiscal management than in the two later wars.

Conclusions. The debt authorities during World War II employed more potentially inflationary devices than were used in either of the previous wars. Pegged securities, short-term securities, and redeemable securities were the core of the World War II program. This strong emphasis on liquid securities must be partly explained as a heritage of the depression. Hard-won low interest rates apparently could not easily be cast aside by the people who made them, especially since the same people also believed that the economy would return to prewar conditions. Thus time and again the Treasury explained its low interest rate policy by stressing the importance of low rates as a contribution to postwar full employment. But perhaps equally important was the fact that by 1942 a host of direct controls had been invented

[13] We can get a rough measure of the value to the Treasury of the legal tender provision at the time of issue by noting that these one- and two-year 5 per cent legal tender notes were issued at par at the same time that one-year 6 per cent certificates of indebtedness were selling at around 95.

[14] Of course the whole 225 million dollars did not circulate as money for the entire time it was outstanding. It seems likely that more of the compound interest notes circulated in their first year (1865) than later. Since the notes were spendable and had the legal status of money, they are included here as part of the monetized debt, though it is clear that only a fine line separates them from some of the nonmarketable issues sold during World War II.

and accepted. The use of direct wage and price controls and rationing removed a major obstacle to the development of the full-scale support program. These two factors—the presumption that inflation would not be a major problem after the war and, just in case, the development of tools to keep inflation under control—help explain the greater emphasis on liquidity in World War II debt policy. Subsequent events made this calculated risk wrong.

But if the calculated risk proved to be wrong, some qualitative gains were still made. Tax exemption with its resultant discrimination in favor of the wealthy was discarded (a difficult weapon to discard if the Treasury is to rely largely on the natural forces of the market). Vigilante subscriptions which act like a tax, without the careful equity considerations generally found in a tax, were virtually eliminated. And, although as it developed in World War II the total effect of the program of tailoring the securities to meet the needs of investors was inflationary, the principle of differentiated markets suggests a more equitable debt structure than the policy of fitting most investors to Liberty bonds.

Broadly speaking, the government is faced with two alternatives in financing a given wartime deficit. First, it can use money and near-money and then rely on a variety of direct controls to restrain inflation. This was the emphasis of the policy followed during World War II and when controls were discarded following the war the inflationary potential was revealed. Second, by using forms of compulsion and/or securities bearing sufficiently high interest rates the Treasury can induce or force the public to give up liquidity. This policy was stressed more in the debt management of World War I. The first alternative would be used where low interest rates, stable bond prices, moderate sales efforts, and direct controls are considered desirable or at least unobjectionable. The second would be used where control of inflation is considered the paramount objective and where continued direct controls are considered objectionable or politically unobtainable.

The central bank may reverse the illiquidity implicit in the second approach when the threat of deflation looms. Open market purchases should be sufficient. But the ability of the central bank to remove the liquidity implicit in the first approach may be severely limited by the composition of the debt. Contractual near-money, such as redeemable bonds and short-term securities, cannot easily be destroyed by the monetary authority. Indeed, there is the possibility that attempts to restrain the "moneyness" of a portion of the debt (say, by dropping pegs) would result in the creation of even more money.[15] The implica-

[15] Of course, if the central bank is willing to completely cut loose from the Treasury, contraction would be possible. But seemingly the more the debt is floating, the more the

tion seems clear that if the debt is to aid in the control of inflation it must consist of securities which are subject to attack by the monetary authority (ideally, consols). In this regard the debt management of World War I was considerably more successful than that of World War II.

But before approving a future war program based primarily on consol-like obligations, several familiar objections must be raised. Could such instruments be sold? Would it be desirable to attempt to distribute such securities widely and permit the repercussions of changes in monetary policy to bear directly on small bondholders as well as large? Would wide distribution of central bank ammunition in this kind of a political system constitute a practical restraint on the use of contractive monetary policy? Answers to these questions are far from obvious (nor do these questions cover all the problems of using consols) but they all suggest one point for consideration; namely, that nonmarketable securities should have a place in a program for financing a future deficit. However, if such securities are used, it would be desirable to restrict the degree of redeemability considerably more than was done during World War II.

If during wartime the general appeal of nonmarketable securities with restricted redemption privileges would preclude a wide distribution, then some form of compulsory program may be necessary. A compulsory lending program tied to income or social security taxes and using, perhaps, a cost-of-living index to determine interest payments would if applied to a portion of the debt have the advantage of leaving the balance of the consol-like debt free to monetary manipulation. In this context of compulsion, even a security reserve program for banks and other financial institutions (and perhaps even nonfinancial concerns) might not appear inappropriate.

The assumption behind these comments is that the lessons of earlier debt management have demonstrated that the primary goal of wartime debt management should be to aid, not hinder, the control of inflation. Even more basically, they assume that debt management should help to distribute the cost of war in a more equitable manner than by inflation. But a "fight inflation at any cost" approach to debt management can, as we have seen, have its own harsh and inequitable aspects. The first task, then, in formulating a program for the management of future war deficits will be to make a clear-cut decision of what the objectives of wartime debt management really are. Once these objectives are established, the demonstrated inventiveness of the monetary and debt authorities should be adequate for the task.

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central bank may be considered responsible for it. See Robert Roosa, "Integrating Debt Management and Open Market Operations," AEA *Papers and Proceedings*, May, 1952, pp. 214-235.

MONETARY POLICY IN RECENT YEARS

By Richard Youngdahl
Federal Reserve Board

Four years ago monetary policy was reinstated as a major measure of government policy for combating booms and depressions. Since then flexible monetary action has played a classical role in dealing with a complete business cycle.

This has also been a period of rediscovery and adaptation of the instruments of monetary policy. From long disuse, the workings of the instruments for general credit regulation had become unfamiliar to the financial and business community. In certain respects, moreover, changed circumstances called for changes in the techniques of their use, although in general old concepts and principles have proved remarkably appropriate to the postwar world. Debt management policies and techniques have also been worked out which help to keep the financing requirements of the federal government from tying down monetary policy and to reinforce monetary policy with debt management actions.

It is the primary purpose of this paper to consider how the three major instruments of general credit policy were actually used in a co-ordinated program looking alternatively toward credit neutrality, restraint, and ease over the period since March, 1951. Open market operations and, in a supplemental way, changes in reserve requirements are the principle means available to the monetary authorities for making available the reserve funds needed to support economic growth while maintaining whatever degree of pressure on bank reserve positions may be considered appropriate to the prevailing economic situation. Reserves not supplied by these instruments are available at the initiative of individual member banks through borrowing at the Reserve banks. When reserve funds are obtained this way, however, banks are obliged to repay and tend to restrict their credit extensions in order to do so.

During most of the period under review, the degree of pressure on member bank reserve positions seems to be most usefully indicated by the volume of member bank borrowing. Another indicator—the volume of unborrowed excess reserves or free reserves—might perhaps be used more appropriately in periods of extreme credit ease because the volume of borrowing cannot become negative. For purposes of this discussion, however, I shall keep to a single indicator: the volume of borrowing.

Revival of Discount Function after the Accord. With the Treasury-Federal Reserve accord in March, 1951, a major restrictive step was

taken in permitting prices of government securities to find their own levels in the market, without open market action by the Federal Reserve to establish them or directly affect them. This action stripped excess liquidity from the economy. It reinstated in the market a distinction between shorter and longer term securities; that is, between securities of little market risk and those of greater market risk. It made it desirable, in fact, to permit a fairly sizable growth in the volume of bank credit and money over the ensuing year or more in order to cushion the force of the policy change.

During this interval general techniques of monetary management which had been dormant for two decades were brought back into use. Most important was the resumption of co-ordinate use of open market operations and the discount mechanism to achieve whatever conditions of supply, availability, and cost of credit were considered appropriate to the developing economic situation. Open market operations became again the instrument for influencing on a current basis the over-all volume of unborrowed reserves of member banks. When policy-making officials believed there was need for restraint on bank credit and monetary expansion, less reserves were made available on an unborrowed basis, thereby obliging banks as a whole to increase their borrowing if they were to expand credit. When easier credit conditions were desired, open market operations were used to reduce the pressure of indebtedness on banks by increasing the volume of reserves available from sources other than borrowing.

The extent of member bank borrowing affects bank lending and investing because individual banks are generally reluctant to remain indebted to the Federal Reserve for more than a temporary period. Indebted banks endeavor, therefore, to make adjustments in their total loans and investments to whatever extent may be necessary for the repayment of their borrowings. When indebted banks make these adjustments, they of course shift at least part of the reserve deficiency to another bank, and that bank will in turn need to borrow and make subsequent asset adjustments to repay.

This shifting among banks of the burden of borrowing at the Federal Reserve tends to make the Federal Reserve discount rate effective. At such times the discount rate becomes the pivotal rate in the money and capital market, and money rates tend to array themselves in relation to the discount rate. In a technical sense, this relationship tells banks whether it is cheaper to borrow or sell securities for a short-period adjustment. When through open market operations member bank reserve positions have been put under pressure (or allowed to get under pressure as bank credit and deposits expanded), money rates tend to range higher in relationship to the discount rate. As bank re-

serve positions ease, market rates will be lower in relation to that rate.

In the postwar world the liquidity positions of banks and of other institutional lenders have been largely involved in the government securities market. In the short- and intermediate-term sector of that market, banks are a major, and generally the dominant, factor. When banks have developed reserve deficiencies and are obliged to borrow, they commonly seek to repay borrowing initially by sales of short-term government securities. When such selling pressure is increasing, yields on short-term government securities tend to rise. Banks under these conditions may also become sellers of intermediate-term and longer issues, or at least will be less interested in buying, and these yields will also tend to go up. Such a development then will affect not only the liquidity of banks but also the liquid position of savings institutions of various kinds because of the reduced value of their sizable holdings of intermediate- and longer-term government securities. Pressure or ease in bank reserve positions is thus reflected rather promptly in the tone of the entire credit market.

When open market operations are being used so as to develop restraint on credit expansion, it will become appropriate at some phase to supplement the action by an increase in the discount rate. This move will strengthen the reluctance of member banks to remain indebted to the Reserve banks by making current borrowing more expensive and probably by lending support to expectations of discount increases yet to come. Conversely, when credit conditions are being eased through open market actions designed to reduce the volume of member bank borrowing, a reduction in the discount rate will help relieve banks of the pressure to make even temporary adjustments in reserve positions in the short-term market rather than by use of borrowing at the Reserve banks. By changing this pivotal rate, moreover, the Federal Reserve exerts a strong influence on the cost of most other kinds of credit, since a rate change is an official recognition of a change in supply and availability conditions for credit that is likely to continue for a time.

In the four-year period since the accord, the interrelationship of the volume of member bank indebtedness, the general tone in credit markets, and the level of market interest rates in comparison with the discount rate have followed the pattern just outlined.

General Credit Measures, Mid-1951 to Mid-1952. During the first year after the accord, monetary policy was relatively neutral. There was a fair balance in the demand and supply of credit, given the credit and monetary expansion the Federal Reserve regarded as reasonable in view of the changed liquidity situation of the economy. Over the period, member bank borrowing at the Reserve banks tended to average

under 400 million dollars, except for the seasonal peak in December. Few, if any, individual banks remained long in debt to the System, but a number were alternately in and out of debt. With this general level of borrowing, the Treasury bill rate remained somewhat under the discount rate of 1¾ per cent, the yield on three- to five-year Treasury securities hovered around 2 per cent, and the yield on twenty-year Treasury bonds fluctuated under 2¾ per cent. Corporate and municipal security yields showed comparable stability and moved within a fairly narrow range.

Actually, during this period of about one year the stability in the general level of interest rates (although not of course in the interrelationship of yields on various types of credit) reflected largely the fact that banks obtained enough reserves from all sources other than by borrowing at Reserve banks to support a substantial bank credit and monetary expansion. This bank credit, added to savings available from nonbank sources, was sufficient to meet at stable interest rates the large credit demands coming to the money and capital market.

Credit Restraint, Mid-1952 to Mid-1953. Pressures of credit demand began to accelerate, however, in the second quarter of 1952 and over the following year, particularly with termination of controls over consumer credit and with the surge of activity that developed in the fall and winter. A vigorous expansion in private spending and in private credit demands developed just as defense outlays were reaching a peak and federal financing needs became exceptionally heavy. The rapidly rising volume of capital expenditures, inventory accumulation, and consumer durable goods outlays—to a large extent financed by credit—were contributing to overtime operations in industry and threatened to develop an unsustainable boom. Credit and monetary policy were turned toward curbing somewhat the expansion of credit and money, with the objective of preventing the volume of nonfederal spending from forming an extraordinary bulge in a relatively short period of time.

The Federal Reserve was not willing under these conditions to provide through open market operations the volume of bank reserves that banks wanted to support their lending activities. With increasing frequency individual member banks were obliged to go to their Reserve banks for temporary borrowing accommodation. As the volume of borrowing increased, member banks intensified their efforts to adjust asset positions so as to be able to repay. Growth in the volume of bank credit thus came under more and more restraint.

Increasing reliance by member banks on borrowing in the second half of 1952 was reflected in a rise in interest rates. Rates on three-month Treasury bills, which had been below the discount rate except

for an end-of-1951 peak, rose above it after mid-1952. Intermediate- and long-term rates also went up fairly steadily over the period. Early in 1953 the Reserve banks increased their discount rates. The credit market had partly anticipated this move in its prior rise, but the rate structure rearranged itself upward somewhat further in adjusting to the new discount rate of 2 per cent.

The volume of bank borrowing continued very large (about 1¼ billion dollars) during the early months of 1953, a season when bank reserve positions tend normally to be easy. Under this pressure, banks redoubled efforts to bring their reserve positions into line, and the rise in interest rates accelerated.

The rise in interest rates in early 1953 and the general tightening in credit availability did not, it should be noted, reflect an actual decline in the total amount of new credit available. It was due, rather, to an extraordinary bulge in the demand for a number of types of credit and the fact that bank credit was not permitted by the monetary authorities to increase by as much as would have been necessary to meet fully this increase in demand.

Credit Easing, Mid-1953 to Mid-1954. By midspring of 1953 monetary measures had made their contribution to preventing an excessive boom. Further monetary tightening was not needed from this standpoint, and developments in money and capital markets and in the economy generally indicated that if further tightening did occur it might cause unnecessary adjustment difficulties in coming months. Credit demands remained intense, but part of the demand was not for immediate use but in anticipation of needs by borrowers who wished to be certain their future requirements would be covered. Accordingly, measures were taken in May and early June to prevent the prevailing intense demand for credit from being reflected unduly in further tightening in the cost and availability of credit and further decline in the capitalization factors of the economy.

Open market purchases were made at that time in sufficient volume to reduce materially the volume of member bank borrowing at the Reserve banks. Reserve requirements were also reduced at midyear. Bank borrowing at the Reserve banks, which in the first four and a half months of the year averaged over 1 billion dollars, was reduced about one-half by the latter part of May and in June and July averaged just over 400 million dollars.

With this easing in the volume of member bank borrowing, both short-term and long-term interest rates declined sharply. By August, Treasury bill yields had declined to the discount rate. Comparable declines from June peaks occurred in yields on intermediate- and long-term securities.

Thereafter, as evidences of slackening in business activity began to accumulate, additional actions were taken to ease the credit situation. Over the summer and fall of 1953, in a succession of steps, credit became cheaper and more readily available. Member bank borrowing continued over the second half of 1953 to average between 400 and 500 million dollars. Interest rates declined steadily over the period.

In January, 1954, and in subsequent months, open market operations were so conducted as to eliminate virtually all member bank indebtedness at the Federal Reserve banks. This condition was maintained over most of 1954 by a succession of open market actions supplemented in midyear by another reduction in reserve requirements. In addition to the decline in borrowing, excess reserves of member banks rose somewhat through the spring and summer following a period of a number of months of stability at around 700 million dollars.

Reflecting the easy reserve position for member banks, market yields went down further and short-term government yields largely lost contact with the discount rate. Reductions were made in the discount rate in February and April, but these probably had little immediate impact in the market since the need for borrowing seemed remote for most banks. More recently, however, with the advent of seasonal credit and money pressures, borrowing has been somewhat more important, and short-term yields have moved into closer touch with the discount rate.

Throughout the year 1954, demand for long-term credit has continued very strong, reflecting large increases in mortgage and state and local government financing which more than offset some declines in the sales of new securities by corporations. Demand for short-term credit by businesses and consumers has been slack. Nevertheless, there has been a substantial growth in bank credit and deposits, due principally to expansion in bank holdings of US government and state and municipal securities.

Monetary Policy and Debt Management. For co-ordinated use of open market and discount policy in an anticyclical program, certain debt management conditions need to be fulfilled. Above all, open market operations must be free to operate as needed to offset changes in the various factors affecting bank reserves. Since there is no reason to believe that these operations will coincide in timing or direction with Treasury refinancing periods and considerations related to these activities, it is important that Treasury refinancing operations be handled in a way that will not require assistance from open market operations. By experimentation over the two or so years following the accord, refunding techniques were worked out that have proved highly successful from the standpoint of both the Treasury and the Federal Reserve.

The effectiveness of monetary policy is improved when the maturity of the federal debt is well spaced over a span of years. When this is the case, credit tightening and credit easing actions will be transmitted more smoothly and promptly throughout the credit market as these actions play on the liquidity of government security portfolios of banks and other lenders and investors. At the same time, however, there should be a large enough volume of short-term issues to support a broad money market adequate to meet the basic liquidity needs of the Federal Reserve System, banks, other financial institutions, and businesses. Progress has also been made in these aspects of debt management.

Summary. In summary, it may be said that during the past four years reserve banking techniques which were developed in this country during the twenties have been revived and used in more or less the fashion of that earlier period to achieve a contracyclical credit and monetary policy. In some respects, however, adaptations have been needed in these techniques to fit them into the present-day institutional framework. The major new fact in the postwar credit world is the existence of a huge government debt. Contrary to widespread fears, however, the size of the debt has not proved an unsurmountable obstacle to a flexible credit and monetary policy and in important respects has been helpful in implementing that policy. In general, the old instruments and principles of reserve banking have again proved themselves in use to be effective and sound.

DISCUSSION

ALBERT G. HART: Professor Robinson's paper affords a very interesting review of wartime debt management. As he points out, such a retrospect is useful above all as background for stand-by planning of economic mobilization—which like all such planning contemplates the possibility that a future war (which could start only because somebody hoped for a *Blitzkrieg*) might again become an endurance contest. Rather than blur the effect of his paper by dwelling on its rather minor flaws, I propose to sketch some of the contingent problems of any future war finance program.

Perhaps the chief lesson from the history of war finance is the tendency of a borrowing program to get diverted from its true aim of stimulating saving into the scoring of purely token triumphs, with distribution of kudos to the manipulators of empty symbols. Imposing bond subscriptions are financed painlessly (even with "free-riding" profit) by people who put themselves in funds by selling previously-bought securities to banks. Savings bond purchases are designed to pick up funds the buyers do not aim to spend, and the savings-stimulating effect of any underestimate of future spending is offset by easy redemption. Tax exemption is made available as a reward for switching assets. In any event (under the pattern of World War II), the incentive effect of tax exemption is frittered away. By failing to promise tax exemption but yet not setting up any efficient machinery to collect taxes on income from savings bonds, we managed to incur the costs of exemption *ex post*, without having it taken into account in savings decisions.

In any future inflationary squeeze (whether due to war or to the more probable event of another sudden bulge in defense spending short of war), a major handicap to policy will be the existing mass of liquid assets. We seem to have inflated ourselves up to the existing mass of currency and checking deposits. But either bond drives or compulsory lending programs will be ineffective if savings bond redemption and bond market support enable asset-switching to pass for saving.

Against this difficulty there are two possible remedies. One, as shown by Shaw and his associates, is to generate saving by drastic rationing of the privilege of spending, cutting existing liquid assets off from the market by some such device as issuing a new "ration currency" and freezing assets. If such a purchasing power rationing system were thoroughly applied, it might both generate the needed current savings and permit the immobilization of those savings. But the struggle to capture scarce goods by making side-payments out of supposedly immobilized assets would be intense. In enacting such a novel program, Congress would instinctively create major loopholes—particularly in a short-of-war situation.

The more orthodox remedy would be to overcome excess liquidity by monetary policy. To reduce the switching problem to manageable proportions, debt policy can work itself into a position where the bulk of nonbank holdings are in long-term marketable bonds. This can be done even in a recession if the authorities are willing to incur interest costs. True, to put more of a refunding into bonds has some deflationary effect; but not more than could

be offset by monetizing a minor fraction to give banks excess reserves. A mixture of bonds plus a little cash, in short, would be much the same in the short run as a mixture of notes and certificates. But in a future inflationary emergency, holders could be frozen into bonds much more effectively than into notes and certificates by permitting yields to rise somewhat. Thus the much-maligned policy of lengthening maturities, if carried out with resolution, could set the stage for a restrictive policy without having short-run restrictive effects.

In case an inflationary emergency develops, monetary policy could do much more than in World War II. In the nature of things, a rationing system would be necessary and would do much of the immediate job of generating savings. Monetary policy could help by encouraging installment buying of bonds (as distinct from lump-sum loans designed to be liquidated by selling the securities). Savings bonds could be given much less liquid redemption pledges. It would be much better after the emergency to have 50 billion dollars of genuine long-term bonds outstanding rather than 60 billions of nominally long-term bonds whose holders could and would redeem them freely. (Our so-called "ten-year" savings bonds have worked out on the average more like three-year notes.) Such a policy would involve higher interest costs and greater discounts on marketable bonds than that of World War II; but it would be much more conducive to saving during and after the emergency. If by any chance there were a tendency to stagnation later on, the government could always restore more liquidity than it had contracted for.

To use less polite language, debt management tends to find excuses for a pussyfooting policy. A good corrective for these excuses is Henry Simons' slogan that the justification of interest is to compensate people for accepting illiquidity, and it is never justifiable to give them interest and liquidity, too—at least *ex ante*. Let me urge more candor in dealing with these problems.

Turning to Mr. Youngdahl's paper, I am inclined to share in the rejoicing over the revival of monetary policy and to agree that Federal Reserve policy has been unusually successful since 1951. But a few reservations should perhaps be registered.

To begin with monetary policy in 1951, this looks better by hindsight than it did at the time. Chairman Martin, two months after the accord, still pictured inflationary pressure as critical in his statement before the House Banking and Currency Committee on the extension of credit powers granted in 1950; and six months after the accord, the *Federal Reserve Bulletin* was still insisting on the need of a "vigorous program of fiscal and credit restraint." Yet under the terms of the accord, the Federal Reserve did not stop increasing its holdings of government securities until October, 1951, and the deposit-supporting power of owned reserves (total reserves less rediscounts) was 5 per cent greater in the fourth than in the first quarter of 1951. Certainly the Federal Reserve was doing at least fairly well by any standards. But speaking as an outsider, without benefit of the files Mr. Youngdahl has evidently reviewed, it seems to me that the Federal Reserve was running a risk, and that

an ideal monetary policy would not have ridden with quite so slack a rein.

By the test of the deposit-supporting power of owned reserves, the Federal Reserve began to tighten in 1952 only in the autumn and turned around in mid-May of 1953. Since the downturn of 1953 is pretty clearly dated in July, this record is a little too good as a response to the weakening of business; and inventories (one of the major criteria invoked by Mr. Youngdahl) were still rising fast. As Mr. Youngdahl intimates, the Federal Reserve was reacting to money market symptoms more than to the general situation. After refusing for some months to respond to the Federal Reserve's mild credit restriction measures, most interest rates began to firm in March—presumably because of uncertainty induced by Treasury financing—and the suddenness of the rise made it natural to ease the market.

As I remarked in relation to Mr. Robinson's paper, I feel some regret that the Treasury and Federal Reserve backed off so easily from the program of lengthening debt maturities. It might have been better to have eased the market enough earlier than mid-May to give the new bond issue a favorable launching and to have taken the occasion to feel out the effect of substituting a mixture of bonds and cash for intermediate-length maturities.

Mr. Youngdahl is scrupulous not to claim too much for monetary policy in relation to the recession that started in 1953. This is a case where it would be easy to prove too much. The Federal Reserve took measures calculated to lower the cost and increase the availability of credit. In the field where we have most to hope from lower rates of interest and relaxed capital rationing—namely, construction—a powerful support for activity has developed. The effect seems a bit too dramatic for the apparent cause. The fact that an increasing share of the flow of savings is channeled through institutions that insist on placing it in securities and mortgages must be a factor in the situation. But it is no mere coincidence that easy money has been accompanied by a strong security market, facilitating corporate and municipal flotations, and pushing institutional investors toward mortgages. Monetary policy may not be the source of all economic blessings; but it is proving more helpful than most of us would have guessed a few years ago—undoubtedly largely because of skillful handling.

EARL R. ROLPH: Professor Robinson has traced for us some of the patterns of war finance that have recurred through the past three major conflicts this country has waged. War results in substantial increases in government expenditures for goods and services and in large deficits. Together these create the inflation potential that explodes into large increases in private expenditures and, except during World War II, into large increases in prices. The government's large financial requirements during wartime lead to an apparent shortage of money—a situation which Secretaries of the Treasury manage to overcome by technically brilliant financial maneuvers. These maneuvers have taken different forms but they are alike in resulting in large increases in the amount of money in private hands. Secretary Chase was driven to the "unsound" procedure of openly printing greenbacks. So ashamed was he of this breach of financial decorum that later, as Supreme

Court justice, he declared his own actions unconstitutional. Nothing so embarrassing was required of the Secretaries during the last two great wars. Money was created, of course, and on a large scale. The Treasury first printed the debt and pursuaded others to create the money.

A recurring theme of war finance stressed by Professor Robinson is the adoption of the tactics of high-pressure salesmanship to sell the debt. Chase was clearly outclassed by Glass and Morgenthau on this score, not that he was niggardly in his efforts. Here we find no great change in the economic ideas of Treasury officials. Success of a bond campaign was judged and is still judged by the test of the volume of business. Failure means that some of the Treasury's merchandise remains on the shelves. So strong was this conception of success that, during World War II, the Treasury consistently underpriced its securities, creating a spread between the sales prices and the support price. The enterprising souls who stood in line to accept these gifts from the Treasury were called "free-riders"; they were also called other names.

The condensed survey that Professor Robinson has just related reveals some change in official ideas, too. In every major war in this and other countries, finance officials have been plagued by the reluctance of some people to buy bonds immediately, preferring to wait for what they hoped would be a better deal. Whether officials should allow this consideration to bother them is a nice question that has a definite answer only if it is assumed that the sale of more debt is better than the sale of less. The corrective technique discovered was, as everyone knows, the practice of having the central bank support the prices of government securities. Secretary Chase had no central bank to perform this operation for him, and he thereby probably spared the country from even more inflation than did occur. Secretary Glass had recourse to the device of supporting the prices of earlier issues by fixing their rates of conversion into later issues—a somewhat clumsy technique even in the most skillful hands.

The fundamental question of debt management during wartime under modern conditions concerns what economic function it is supposed to perform. Finance officials have been almost obessed with the idea of raising money. But of course a sovereign government always has access to unlimited financial means. Presumably the economic purpose is to force or persuade people to buy debt instead of buying goods and services. But the apparatus of direct controls has made this purpose largely obsolete. Scarcely anyone can be found who believes that the 2 per cent yield of World War II made any important difference. In any event, there exists a much simpler method of preventing private borrowers from taking advantage of low rates of interest. A tax could be imposed on borrowers in amounts equal to, say, 10 per cent of the proceeds of any loan and collectible at the source by the Federal Reserve banks. We can have the advantages of a 10 per cent war without the Treasury troubling itself to sell debt at all. The gains of such a system are many. Not the least would be that of sparing the country the exhortations of bond salesmen. Another would be the reduction in the vast amount of paper work involved in turning the Treasury into a savings bank. Professor

Robinson apparently takes the view that debt management has a role to play in an all-out military effort. I think he is mistaken. The best system of debt management during such a period is no debt management at all. If it is objected that the resulting flood of money would create postwar problems, the answer is that there exists no method, except much heavier taxation than any country has seen fit to impose, to avoid postwar problems. With no wartime debt management, it is unlikely that we would again handcuff ourselves because of fears of postwar deflations.

Mr. Youngdahl has presented an interesting abbreviated history of monetary policy since the accord. I find myself somewhat out of sympathy with the tone of Mr. Youngdahl's remarks—I mean with his interpretations of the evidence, not with his account of the evidence. I detect a note of misplaced complacency. We are told that "the old instruments and principles of reserve banking have again proved themselves in use to be effective and sound." The word "again" should be sufficient to give anyone pause. When was it that the old instruments proved themselves so effective? The history of the Federal Reserve is not one of striking successes. Even if we limit our attention to the postwar era, there have been failures. It should be recalled that it was the Federal Reserve officials who decided to offset the deflationary effects of the Treasury surplus during the immediate postwar years. It is customary but not convincing to place the responsibility for these policies solely upon the Treasury. The policy of supporting the structure of yields on federal securities was vigorously supported by officials of the Federal Reserve System before Congressional committees and in the public print. Not even the Treasury can be charged with the incredible policy of supporting the bond market in reverse during the recession of 1949. But let us be careful about blaming anyone but ourselves—professional economists—for these policies. We failed to speak with a clear voice when it mattered.

The restoration of the old tools of monetary management since the accord have consisted, according to Mr. Youngdahl's account, of restrictions on bank borrowing, supplemented by open market operations and changes in legal reserve requirements. Instead of supporting the prices of Treasury obligations, the Federal Reserve has supported the prices of bankers' obligations. To a simple-minded person like myself, there seems to be no vast difference between these and former practices. Let us be clear that bank borrowing from the Reserve banks is inflationary; it is another way that banks obtain reserves. Youngdahl stresses the point that banks are reluctant to borrow. When circumstances beyond their control force them into debt, they stop increasing, or is it that they merely increase less rapidly, the quantity of money in private hands. No doubt it is true that banks are reluctant to borrow, but like many ordinary persons, bankers allow their reluctance to be overcome by more attractive alternatives. Mr. Youngdahl has pointed out that the yields on some classes of short-term securities move together with the discount rate. This fact suggests that the reluctance to borrow is conditional; it depends upon the foregone gain of other methods of obtaining reserves. The technique of relying upon some automatic tendency on the part of banks to adjust their asset positions to the level of their indebtedness seems to me to be

dangerous. It permits the public and the banks to determine monetary policy, and this, I think, is the fundamental objection to the earlier policy of supporting the government bond market. The elimination altogether of the privilege of banks to borrow from the Reserve banks seems to me to be a desirable reform.

During the mild recession we have been experiencing, the Reserve officials have not exhibited the aggressiveness that someone who believes in vigorous monetary policy would like to see. One could even debate whether the Federal Reserve System has allowed the expansionary effects of the federal deficit to exercise its full influence on private expenditures during the period since the fall of 1953, when the evidence was reasonably clear that the economy was in a decline. Imagine, if you will, what the situation might have been if the Treasury had possessed a very large cash balance at that time and had, instead of selling debt, allowed its cash balance to fall by the amount of the deficit. Imagine further that the Federal Reserve had simply allowed this cash to flow into the hands of the public, leaving reserve requirements and the discount rate unchanged, and had engaged in no open market operations. Such a policy is neutral in the sense that monetary management exerts no independent influence on private expenditures. This criterion of neutrality rests upon the belief that the Federal Reserve cannot take responsibility for the automatic flexibility of the tax system nor for other features of fiscal policy. Would the effect on the spending behavior of private groups have been less stimulating in this event than that of the policies actually pursued? From this point of view, it is generous, I think, to hold that the Federal Reserve has adopted even a neutral policy to offset the recession. It is true to be sure that the policies adopted have not been as restrictive in fact as they might have been.

On the subject of economic stabilization, there is nothing much more dangerous than to suppose that we have at long last in this country a body of monetary and fiscal devices adequate to the task of preventing large swings in private expenditures. We do not as yet have even a deliberate synchronization of fiscal and monetary policies. Mr. Youngdahl notwithstanding, the old principles of monetary management are no longer good enough.

TAXATION AND INCOME DISTRIBUTION

THE DIFFERENTIAL TAX BURDEN ON STOCKHOLDERS

By DANIEL M. HOLLAND
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Introduction

This is a report on some of the findings of a study I have been undertaking at the National Bureau of Economic Research.[1] I shall place major emphasis on the conceptual framework of my project and its findings; the discussion of assumptions and procedures will, perforce, be cursory, but I must warn you that the findings are highly qualified—valid only within the premises and techniques used in their derivation. An analysis of our method and its limitations will be found in the full report now in preparation at the Bureau. Undoubtedly, too, many of the qualifications will be brought out by the discussants. The primary limitation, however—our assumption that the corporation income tax is not shifted—deserves specific mention at the outset.

My investigation is concerned with estimating the income tax load on stockholders and the degree of differential taxation to which they have been subject. This is a matter that aroused great controversy and about which there appeared to be much misunderstanding in the discussions of the relief provision of the Internal Revenue Code of 1954.[2]

[1] This study was initiated under the guidance of the late Robert Murray Haig, to whom I am deeply grateful for both advice and encouragement. It has been the beneficiary of searching critical readings, at one stage or another, by Arthur F. Burns, Lawrence Seltzer, Carl Shoup, Richard B. Goode, W. Leonard Crum, Geoffrey Moore, Richard Slitor, and Thor Hultgren. In addition an earlier version of the study has been read by Leo Wolman, Simon Kuznets, Dan Smith, Gerhard Colm, William S. Vickrey, A. G. Hart, C. Lowell Harriss, Maurice E. Peloubet, Marshall Robinson, and C. Harry Kahn. To these men my deepest thanks. It should be understood that this does not mean to imply that they supported my point of view or my procedures. Quite the contrary in a number of cases Nor do I mean to "socialize" the blame. All errors and oversights are mine alone. For helpful advice and computation assistance in the earlier stages of the project, I wish to thank Bella Shapiro, Gloria Moskowitz, and Fred Stewart. Finally I am most grateful for the critical insight of Doris Eiseman and Mary Ann Zimmerman, who, in addition to doing most of the computations, helped me clarify a number of conceptual problems.

[2] The author does not claim, of course, either to have cleared up all the ambiguities or difficulties of this problem or to have blazed a trail in isolating the relevant considerations. A number of investigators have worked in this area. Among the most substantial contributions are: Richard B. Goode, *The Corporation Income Tax* (John Wiley and Sons, 1951) and *The Postwar Corporation Tax Structure* (Treasury Department, Division of Tax Research, 1946) W. L Crum, "The Taxation of Stockholders," *Quart. Jour. Econ.* (February, 1950); also, the *Preliminary Report* and *The Final Report* of the Committee on the Federal Corporate Net Income Tax, Harold M. Groves, Chairman. The *Preliminary Report* was made in 1949 and the *Final Report* in 1950 to the National Tax Association, which had established the Committee, at the Association's annual meetings.

How Heavily Are Stockholders Taxed?

While it is generally agreed, if the incidence of the corporation income tax is taken to be on profits, that stockholders compared with other persons are subject to a differential tax load, there are divergent points of view about the nature and relative weight of this differential burden. Some critics, placing the emphasis on distributed corporate earnings, point to the fact that they are taxed first at the corporation level when earned and again at the personal level when distributed and contend, therefore, that this source of income is "overtaxed." This was one of the reasons cited by President Eisenhower for the relief provision recently incorporated in the Internal Revenue Code of 1954. (*Congressional Record,* Volume 100, No. 11, Eighty-third Congress, 2nd Session, page 549.)

Others, however, concentrating on the undistributed segment of corporate earnings emphasize that this income source escapes its fair share of taxation, because it is not subject to the high marginal rates of personal income tax that would have applied had it been distributed to stockholders. Such was the emphasis of President Roosevelt's initial proposal of an undistributed profits tax in 1936. (*Congressional Record,* Volume 80, Part 3, Seventy-fourth Congress, 2nd Session, page 3146.)

Clearly, the considerations raised by both points of view are relevant in the determination of the differential tax load on stockholders; the final answer rests on the relative strength of these two factors. Either contention—i.e., primarily overtaxation or primarily undertaxation—can be proved by an appropriate set of illustrative figures. This being the case, it seemed sensible to use the most realistic data available: the data of *Statistics of Income,* the annual Bureau of Internal Revenue tabulations from tax returns.

Our Procedure

Basic to our "standard" method is the assumption that the corporation income tax rests on profits. While no unanimity of opinon exists on this score, the view that the tax is not shifted, particularly in the short run, is still most widely held. Moreover, it is the view germane to any contention that stockholders are differentially taxed. (Not to be dogmatic, however, we present below the results from an alternative calculation that assumes half the tax is shifted.)

Central to our procedure, also, is the assumption that in all income classes, stockholders' share of corporate earnings before tax can be determined by a proportionate allocation based on dividend receipts. So from the aggregate data on pretax corporate earnings we can obtain a ratio by which to "blow up" dividend receipts to pro rata shares of net corporate earnings. (Hereafter, unless otherwise specified, the

phrase net corporate earnings refers to corporate income before taxes; i.e., the sum of dividends, corporate savings, and corporation income taxes with corporate savings taken net of deficits.)

Then from a cross-classification for dividend recipients (stockholders) of income class and dividend size class we break up the array of stockholders into some 225 cells. For example, from this array we get an entry for stockholders with adjusted gross income of $4,000 and under $5,000 with dividend receipts of more than zero and less than $100, another for those at this same income level with dividend receipts of between $100 and under $200, etc. To the average amount of dividends in each of these cells we apply the corporate earning multiplier and add this product to stockholders' average adjusted gross income. We call the result imputed gross income. It includes all of net corporate earnings rather than dividends as the measure of personal income from corporate activity.

Next, stockholders and the data relevant to them are rearrayed in new income classes based on the size of their imputed gross income. We strike averages for these classes, plot them, and obtain a schedule from which to read off the relevant data for a number of selected imputed gross income levels from $1,000 to $500,000. To measure the degree of differential taxation we break down net corporate earnings into two components: earnings for distribution (i.e., the sum that had to be earned, in view of the corporate tax, to enable the actual amount of corporate dividend payments) and earnings for retention defined, similarly, as the pretax counterpart of retained earnings.

We address ourselves first to the double taxation of distributed earnings (earnings for distribution). In this connection the "extra burden" on stockholders is measured by the excess of the sum of the corporate tax on earnings for distribution and the personal tax on dividends over the potential personal income tax on earnings for distribution. The extra burden expressed as a fraction of its base we call the differential, and in this case it is equal to $C\ (1 - P)$, where C equals the corporate rate and P the relevant personal marginal rate. Since P rises with stockholders' income but never reaches 100 per cent, the differential against the earnings for distribution segment of the stockholder's share of net corporate earnings falls as the level of stockholder income rises, but always remains positive.

But this is only part of the story. What about the undistributed segment? Here the extra burden equals the corporate tax on earnings for retention minus the potential personal tax on this same base. Expressed as a fraction of earnings for retention this comes to $C - P$. (This P is, of course, higher than the P in the earnings for distribution formula; the C is, also, because earnings for retention are taken net

of deficits.) In this case, depending on the relative heights of C and P, the differential can be positive, negative, or zero. With C invariant with stockholders' income and P a rising function thereof, the differential will decline as stockholder income rises, and after a point, if P is high enough it will (and in most of the years of the decade of the forties did) become negative, turning into a tax "benefit."

A combination of the two measures we have just discussed provides the composite or net result: the differential against net corporate earnings, which is a weighted average of the differential against each of the components of net corporate earnings.

Let D be earnings for distribution and R earnings for retention. Then the differential against net corporate earnings equals:

$$C\ (1-P)\frac{(\ D\ )}{(D+R)} + (C-P)\frac{(\ R\ )}{(D+R)}$$

It will be a declining function of stockholders' income. Further, after a point the differential against earnings for retention can (and in most years of the last decade did) weigh so heavily that the extra burden on net corporate earnings will become negative. In other words, at incomes above some high level an income tax differential in favor of net corporate earnings will prevail.

By this measure we can answer the question: How much more (or less) heavily were corporate earnings actually taxed than they would have been had they been subject in full to the personal income tax alone?

We have used one more measure in our analysis. By relating the extra burden to the total income of stockholders, we obtain the differential against (or in favor of) stockholders. With this measure we answer the question: How much more heavily, measured in terms of effective rates, were stockholders actually taxed by the combined corporate-personal income tax system than they would have been with the corporate tax abolished and their pro rata share of net corporate earnings subject fully and promptly to the personal income tax?

Let O be stockholders income from sources other than corporate earnings, then the differential against stockholders equals:

$$C\ (1-P)\frac{(\ D\ )}{(D+R+O)} + (C-P)\ \frac{(\ R\ )}{(D+R+O)}$$

One further point about our measures. It can be argued that some portion, at least, of retained earnings would show up as capital gains, and that some of these gains, in turn, would be realized in taxable form, and thus sometime in the future an additional personal income

tax liability would be incurred. In measuring the actual tax load on earnings for retention, therefore, we added a term representing the estimated present value of this future capital gains tax liability. Needless to say, the adjustment is not very precise. In any event, it is relatively minor.

So much for the conceptual framework. Now what have we found out?

The Findings for a Selected Year—1950[5]

Our basic data—the tabulations in *Statistics of Income*—come out with a lag of several years; 1950 is as contemporaneous as we can get. How heavy was the differential taxation of net earnings and stockholders in this year? The answer is summarized on Chart I.

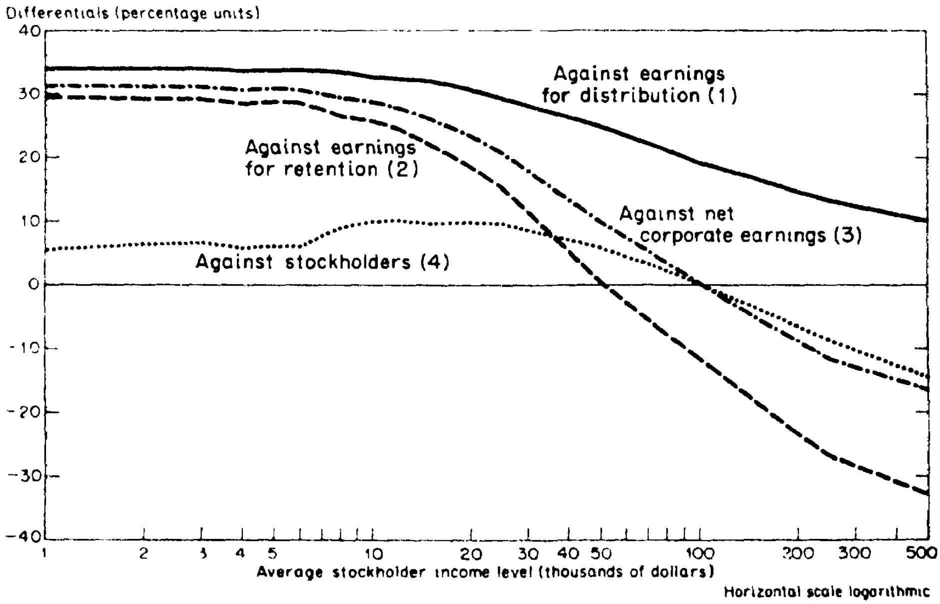


CHART I. DIFFERENTIALS, 1950

From an examination of line 1 it appears that the double taxation of distributed earnings was substantial. At the bottom of the taxable stockholder income scale, for example, earnings made for distribution to stockholders were subject to a tax liability over 34 percentage points higher than would have been their due under the personal income tax

[5] The findings presented here and in what follows are preliminary. They are the result of numerous calculations all of which have not yet been checked. However, it is unlikely that the arithmetic errors that will be uncovered will change our results substantially. The entries in Chart 1 and Tables 1, 2, and 5 are weighted averages of the data for joint and separate returns.

alone. At the $25,000 stockholder income level the net extra burden averaged about 29 percentage points, and at the top of the stockholder income range plotted on the chart ($500,000) it came to 10 per cent. The higher the stockholder income level the lower the differential against earnings for distribution.

While the differential against earnings for retention follows the same general pattern, the magnitudes involved are smaller and its fall is sharper. This is most apparent over the upper portion of the stockholder income array. Starting at 30 per cent for the lowest income stockholders, it fell very rapidly, so that by the $25,000 mark it was only 15 per cent; the fall continued, the burden changed to a benefit, and at the top of the stockholder income scale we found a differential of −33 per cent.

The weighted average of these two measures—the differential against net corporate earnings (line 3)—follows, of course, the general pattern of the two differentials that comprise it and falls in between them. Reflecting the greater absolute magnitude of earnings for retention, its value when plotted lay closer to line 2 than to line 1. Over most of the income range, the net corporate earnings component of stockholders' income was "overtaxed," but for stockholders higher up the income scale, "undertaxation" occurred. Very heavy was the extra burden at the lower stockholder income levels—between 31 and 29 percentage points over the span from $1,000 to $10,000. After $10,000 the differential against net corporate earnings fell rapidly, reaching zero at around $100,000 and a nadir of −16 per cent at $500,000 of stockholders' income.

The fact that this component of their income was subject to a differential tax liability means, of course, that stockholders' income *in toto* was either over- or undertaxed. It appears that most stockholders—on average, those whose incomes ranged from $1,000 to $50,000—were liable for a sizable extra income tax liability. (Over this income interval it ran from 6 to 10 additional percentage points of tax.) But as we examine the stockholders near the top of the income scale a different picture emerges, for the differential declined very rapidly after the $50,000 point. Again, as an average result, stockholders with incomes higher than $100,000 enjoyed a tax benefit that became relatively more important the larger their income.

Our findings are for average stockholders; so we have no way of telling precisely how many fell in the over- and undertaxed categories. For 1950, however, we can furnish a reasonable figure on this score, because we had to examine the tax liability in each stockholder cell for our "partnership" method revenue estimate reported on below. Of the 3.4 million double-taxed stockholders, about 3.3 million, or 97

per cent, paid a higher combined corporate-personal income tax liability than would have been due under the personal income tax alone; they were, therefore, overtaxed. On the other hand, some 3 per cent, about 100,000, were undertaxed. While small as a proportion of all stockholders, the undertaxed group assumes greater importance when we measure its share of all double-taxed net corporate earnings. Here, because the distribution of net corporate earnings is highly concentrated, we found that about 46 per cent of net corporate earnings imputable to personal income taxpaying dividend recipients was undertaxed. (In deriving these figures we did not make the future capital gains tax liability adjustment alluded to earlier. However, this does not seriously affect their relevance for the purpose at hand.)

The same measures elaborated for 1950 have been undertaken for all the intervening years since 1940, except 1942 and 1943. It goes beyond the scope of this paper to examine them in detail here. In general their pattern is similar to the fifties, but, of course, the height of the differentials varied considerably over the period.

Two Alternative Assumptions

Our procedure, we recognize, is open to numerous objections and criticisms. At a number of points along the line we made a specific choice from among a number of possible assumptions and, in some cases, at least, strong support can be found for one or another of those alternatives that we failed to select.

In particular, had we chosen a variant assumption on the incidence of the corporation income tax or an alternative definition of net corporate earnings, our results would have been noticeably different from those we have just reported on.

Therefore, for 1947, we measured the differentials on the assumption that half the corporate tax is shifted. From this test one simple conclusion emerges. (See Table 1.) To the extent that the corporation income tax is shifted, our findings based on the standard assumption involve an overstatement of the extra burden on net corporate earnings and stockholders.

Similar accounting conventions are used in defining income for the personal and corporation income taxes. Since we are comparing the actual tax of one system with the potential tax of the other, we did not feel it necessary conceptually to redefine income to take account of the effects of rapid and sharp increases in the price level. However, as a matter of some interest and out of deference to a substantial body of opinion which holds that the BIR definition of income is seriously inappropriate when price levels change rapidly, we undertook an additional alternative calculation for purposes of which we lowered the

TABLE 1

COMPARISON OF DIFFERENTIALS UNDER STANDARD METHOD AND FIFTY PER CENT SHIFTING ASSUMPTION, 1947

Imputed Gross Income Level (000)	Differential Against Net Corporate Earnings			Differential Against Stockholders		
	Standard Method	Shifting Assumption	2–1	Standard Method	Shifting Assumption	5–4
	1	2	3	4	5	6
$ 1 . . .	24.0	11.2	−12.8	5.9	2.4	−3.5
3 . .	23.8	10.9	−12.9	4 8	2.6	−2.2
5. . .	22.4	9.6	−12.8	5.2	2.4	−2.8
10	17.9	4 8	−13.1	6.5	1.6	−4.9
25. . . .	2.0	−10.0	−12.0	1.0	− 4 5	−5.5
50. .	− 7.6	−18.1	−10.5	− 4.8	−10.9	−6.1
100. . .	−16 2	−26.3	−10.1	−11.9	−18.4	−6 5
250. . . .	−24.5	−33.9	− 9 4	−19.7	−26.6	−6.9
500.	−25.8	−34.9	− 9.1	−23.0	−31.3	−8.3

total of corporate earnings imputed to stockholders by the inventory valuation adjustment and the estimated excess of current over historical cost depreciation. The results are summarized and compared with our standard method in Table 2.

Our conclusion from this test is that for years of rising price levels, if it is considered sensible and relevant to allow for current costs of inventory maintenance and depreciable asset replacement in defining taxable income, our standard case understates the differential against

TABLE 2

COMPARISON OF DIFFERENTIALS UNDER STANDARD METHOD AND CURRENT COST ASSUMPTION, 1947

Imputed Gross Income Level (000)	Differential Against Net Corporate Earnings			Differential Against Stockholders		
	Standard Method	Current Cost Assumption	2–1	Standard Method	Current Cost Assumption	5–4
	1	2	3	4	5	6
$ 1	24.0	39.7	15.7	5 9	8 1	2.2
3.	23.8	39.4	15 6	4.8	9.8	5 0
5.	22.4	38.0	15.6	5.2	9.4	4 2
10.	17.9	33.4	15.5	6.5	11.0	4.5
25.	2.0	18.3	16.3	1.0	7.3	6.3
50.	− 7.6	10.0	17.6	− 4.8	5.5	10 3
100.	−16.2	1.6	17.8	−11.9	1.0	12.9
250.	−24.5	−5.3	19.2	−19.7	−4.2	15.5
500.	−25.8	−5.6	20.2	−23.0	−5.2	17.8

stockholders and net corporate earnings. But the basic pattern of our findings remains. Under the current cost alternative, too, the differentials fall as stockholders' income rises, and, after a point, they turn in favor of net corporate earnings and stockholders.

Revenue Aspects of the "Partnership" Method

Were shareholders to be taxed on their corporate earnings as members of a partnership are taxed on their share of its income, the corporate entity as such would drop out of the picture. Since stockholders would be held accountable under the personal income tax for their pro rata share of corporate earnings, all such earnings would be promptly and fully called to account and subject to only one income tax. Over, under, or unequal taxation of corporate earnings would cease to exist. In what follows it should be clearly understood that we neither support nor condemn the partnership method of taxing corporate earnings, nor do we raise the question as to whether it is in fact a practical alternative. (Some students who admit its desirability in principle question its administrative feasibility.) In addition, we assume, as we have for the most part earlier, that the incidence of the corporation income tax is on profits, and that the same ratio of dividends to net corporate earnings characterizes each of our income class dividend size cells.

For several years—1947, 1949, and 1950—we have estimated the revenue loss or, possibly, gain that would ensue upon the institution of the partnership method. These estimates are of interest in and of themselves, for in a period of heavy federal government revenue requirements, among the relevant criteria for evaluating a proposed change in the tax structure is its revenue effect. More particularly, in the context of our study, these estimates constitute a measure of the aggregate extent of the unequal taxation of stockholders, thereby complementing the differentials which are average measures of experience at selected income levels and, therefore, furnish no idea of the total amount of differential taxation of all double-taxed stockholders.

Our starting point in these estimates was to consider the corporate tax abolished and the revenue it raised lost to the Treasury. How far would the increased personal income tax collections due to full imputation of net corporate earnings go toward recouping this revenue loss? To answer this question we estimated for each of our stockholder cells (i.e., the cells in the cross-classification of income and dividend size class) the increase in personal income tax liability that would follow full imputation of stockholders' pro rata share of net corporate

earnings. (Numerous details are involved in our procedure. All we do here is present its basic features.) We did the same for taxable estates and trusts. The difference between the corporate tax liability sacrificed by shifting to the partnership method and the increase in personal income tax liability constitutes the net revenue loss on a current basis; i.e., that portion of the revenue loss that would occur in the year of the shift to the partnership method.

But this is not the end of the story. A further loss in revenue is to be expected. For, following the treatment now accorded partnership shares, the basis of valuation for the purposes of determining capital gains would be reduced by the full amount of imputed retained earnings. On this score, future capital gains and the tax liability thereon would be lower because of the switch to the partnership method. It goes without saying that the lack of any real evidence germane to this item causes this portion of our estimate to be characterized by a much lower order of accuracy than the current revenue loss figures.

Quite varied are the results for our selected years (see Table 3). In 1947, for example, the Treasury would probably have suffered no revenue loss by a shift to the partnership method, currently. Over the indefinite future, however, tax collections would have totaled between 1 and 1.5 billion dollars less because of the imputed retained earnings of 1947. In 1949, a more sizable current revenue loss would have developed. For 1950, our estimate of the loss runs at a still higher level. The current revenue loss of around 3.5 billions represents a little under 10 per cent of total corporate and personal income tax liabilities. (As tabulated in *Statistics of Income*, the corporation income tax liability in 1950 came to 17.3 billion and personal to 18.6 billions.) To recoup it, something like a 3.2 percentage point upward shift in the personal income tax schedule would have been necessary. Moreover, we estimate a future revenue loss of around 1.4 billion dollars. For 1953, a more substantial revenue loss is indicated: 5.7 billions currently and 1 billion more in the future. To maintain the estimated 1953 level of tax receipts, a rise of four points in personal income tax rates would have been required.

The difference in the revenue loss among these several years is to be explained by variations in the relative heights of the corporate and personal income tax, the magnitude of net corporate earnings, and the proportions represented by dividends and retained earnings.

It seems safe to conclude that only in a prosperous year, with the corporate rate under 40 per cent, the personal rate structure effectively as high as it was in 1947, and a high proportion of corporate earnings retained, would a switch to the partnership method not involve a current loss of revenue to the Treasury.

TABLE 3

PARTNERSHIP METHOD REVENUE LOSS*

(Dollar Amounts in Billions)

Year	Current	Future	Total	Percentage Point Rise in Tax Rates Required to Recoup Current Revenue Loss
1947	0.2†	1.2	1.0	−0.2
1949......	2.2	0.9	3.1	2.5
1950 ..	3.5	1 4	4.9	3.2
1953... ...	5.7	1.1	6.8	4.0

* The 1953 values are considerably less reliable than those for the other three years, for no detailed data pertaining to this year are yet available. Despite this, however, the figures appear in the table because of the interest that attaches to the most recent experience.

† Revenue gain.

The Aggregate Extra Burden

The data assembled in connection with the partnership method revenue loss estimates bear on another problem discussed earlier in this paper. We have already examined the net extra burden of the corporation income tax on average stockholders at selected income levels. Now we can approach it somewhat differently, concentrating on aggregates rather than averages. How heavy an extra burden did the corporation income tax represent in the aggregate? In what follows, this query is answered only in terms of what we have called above the current increase or decrease in tax liability under the partnership method. Unlike the differentials presented earlier, these data take no account of the future capital gains tax liability.

Table 4 presents the relevant information. In every year analyzed, for stockholders in the upper portion of the income array, the partnership method would have meant a heavier tax liability than they actually were subject to. These stockholders, then, in the aggregate, even though double-taxed, were undertaxed. On the other hand, stockholders in the lower portion of the distribution were overtaxed. Had a switch to the partnership method been made, their income tax liability would have been lower. By far the larger portion of stockholders were overtaxed, but a not insignificant number in some classes were undertaxed. (See column 6.) Much larger, however, is the proportion of net corporate earnings falling in the undertaxed category. In 1950, for example, as already noted, this came to about 46 per cent.

The Relief Provisions of the Internal Revenue Code of 1954

Very recently what has been described by its proponents as a

TABLE 4

A COMPARISON OF THE TAX LIABILITY OF STOCKHOLDERS UNDER THE CORPORATION-PERSONAL INCOME TAX SYSTEM AND THE PARTNERSHIP METHOD, 1947, 1949 AND 1950*

Imputed Gross Income Class (thousands)	Tax Liability: Corporate-Personal Tax System (million)	Tax Liability: Partnership Method (million)	3 as a Percentage of 2	Number of Stockholders with Partnership Method Liability Higher than Corporate-Personal Income Tax Liability	Percentage of Total Returns in Class "Undertaxed"
1	2	3	4	5	6
1947					
Under $2	$ 57.7	$ 36.7	64	—	—
2 under 4	470.7	314.4	67	—	—
4 under 5	253.8	184.3	73	—	—
5 under 7	600.1	409.9	68	—	—
7 under 10	749.1	542 9	72	—	—
10 under 25	2,607.4	2,248.8	86	—	—
25 under 50	2,342.9	2,468.5	105	134,311	79.8
50 under 100	2,588.4	3,243.0	125	75,718	100.0
100 under 500	2,938.2	4,177.6	142	28,955	100 0
500 under 1,000	668.4	1,045.3	156	1,791	100 0
1,000 and over	808.7	1,282.4	159	649	100 0
Total	14,085.4	15,953.8	113	241,424	7.4
1949					
Under $2	27.0	14.9	55	—	—
2 under 4	278.8	171.6	62	—	—
4 under 5	233.4	148.0	63	—	—
5 under 7	634.5	400.3	63	—	—
7 under 10	719.4	449.6	62	—	—
10 under 25	2,415.9	1,664.4	69	—	—
25 under 50	1,665.6	1,350.8	81	10,219	6.5
50 under 100	2,257.9	2,114.4	94	28,378	32.2
100 under 500	3,010.8	3,482.1	116	37,455	99.5
500 under 1,000	705.9	942.1	133	2,321	100.0
1,000 and over	857.5	1,148.3	134	801	100 0
Total	12,806.5	11,886.3	93	79,174	2.5
1950					
Under $2	23.3	13.2	57	—	—
2 under 4	230.8	135.0	58	—	—
4 under 5	297.9	181.0	61	—	—
5 under 7	738 3	474.9	64	—	—
7 under 10	706.4	398.9	56	—	—
10 under 25	3,102 1	2,028.9	65	—	—
25 under 50	3,002.9	2,365.7	79	12,252	5.2
50 under 100	3,776.3	3,660.5	97	37,945	33.3
100 under 500	5,192.7	6,150.6	118	50,788	99 8
500 under 1,000	1,241.2	1,683.0	136	3,149	100 0
1,000 and over	1,747.0	2,328.6	133	1,213	100 0
Total	20,058.9	19,420.3	97	105,347	3 2

* The fact that in 1947 taxable dividend recipients would have probably had a higher income tax liability under the partnership method than under the combined corporate personal income tax system is not inconsistent with our findings that, on a current basis, no increase in revenue would have accompanied a change to the partnership method. Nor are the virtually identical tax liabilities for taxable stockholders under the two systems reported in Table 4 for 1950 a contradiction of our conclusion that in that year a sizable revenue loss would have occurred immediately upon the introduction of the partnership method. For not all dividends show up on taxable returns. For these two years, we were able to trace only between 82 and 83 per cent of net corporate dividend payments to the taxable returns of individuals and estates and trusts. For a variety of reasons—provisions of the tax law, oversight, dishonesty, etc.—the remaining 18 per cent does not get into the personal income tax mill. So the partnership method tax base was only 82 per cent of the corporate tax base.

"significant step in the right direction"[4] has been taken to afford stockholders some relief from the double taxation of dividends. Under the provisions of the Internal Revenue Code of 1954, the first $50 of dividends received from domestic corporations (the first $100 for joint returns) is excluded from taxable income, and further, stockholders are given a credit against personal income tax equal to 4 per cent of the remainder of their dividend receipts. (Internal Revenue Code of 1954, Public Law 591, Chapter 736, Sections 34 and 116. This is considerably less generous than President Eisenhower's original proposal which called for exclusions double the size finally settled on and a tax credit ultimately to reach 15 per cent.)

Thus relief is provided only for distributed earnings and it therefore deals with only a portion of the problem of the differential taxation of corporate earnings. (Apparently, also, no relief is afforded dividend recipients who are not subject to the personal income tax.) But even when viewed more narrowly within their own framework, i.e., from the point of view of distributed earnings only, these relief provisions do not appear to be a particularly satisfactory "step in the right direction."

We have pointed out above that as regards earnings made for distribution to stockholders, the corporation income tax constitutes a net extra burden equal to $C\ (1 - P)$. The higher the stockholders' income, the lower the extra burden of the corporation income tax. The relief provisions of the Internal Revenue Code of 1954, however, are not geared to this relation. The tax credit, by providing a constant amount of relief at all income levels, operates in such a way that a greater degree of relief is obtained the higher the stockholders' income level, and the relief provided by the exclusion is a rising function of stockholders' income.

More specifically, the credit is equal to 4 per cent of dividends. Since the extra burden falls as stockholder income increases and the credit is the same absolute amount per dollar of dividends at all income levels, the higher the stockholders' income, the greater the proportion of the extra burden removed by the tax credit. As for the exclusion, the relief it affords ranges under 1954 rates from 20 cents to 91 cents per dollar of dividends, the amount of relief increasing with the marginal rate of personal income tax.

So far our discussion of the relief provisions has run in terms of marginal dollars of earnings for distribution. The over-all result, however, is a more complicated story, because it depends on how heavily each relief provision is weighted in the total relief granted, and this,

[4] Remarks by Marion B. Folsom, Under Secretary of the Treasury, before the American Management Association, Hotel Statler, New York City, August 19, 1954.

in turn, depends on the absolute size of the dividend (or earnings for distribution) component of stockholders' income. Per dollar of dividends, the exclusion gives greater relief at all income levels. However, its absolute amount is limited.

To determine how much relief, all things considered, will be provided by the Internal Revenue code of 1954, we applied its provisions to our "average" stockholder data for 1950, this being the most recent year for which the necessary tabulations are available. Our findings are presented in Table 5. (The reader is reminded that stockholder incomes include the retained as well as the distributed portion of net corporate earnings.) The relation between the degree of relief and stockholders' income is U-shaped. Proportionately the greatest relief occurs at the bottom and top of the income scale, with a lesser degree of amelioration

TABLE 5

ESTIMATED REDUCTION OF NET EXTRA BURDEN ON EARNINGS FOR DISTRIBUTION DUE TO RELIEF PROVISIONS OF INTERNAL REVENUE CODE OF 1954, USING DATA FOR 1950

Imputed Gross Income Level (thousands)	Differential Against Earnings for Distribution		Reduction in Differential Due to Relief	
	Before Relief	After Relief	Absolute (percentage points)	Relative (per cent)
1	2	3	4	5
$ 1	34.1	24.1	10 0	29.3
2	34.1	26.4	7.7	22 6
3	34.1	27.6	6.5	19 1
4	33.7	27 4	6.3	18.7
5	33.8	28.3	5.5	16.3
6	33.9	28.8	5.1	15.0
8	33.7	29.9	3.8	11.3
10	32.8	29.3	3.5	10.7
12	32.6	29.3	3.3	10.1
15	32.1	29.1	3.0	9.3
20	30.8	27.9	2.9	9 4
25	29.2	26.3	2 9	9.9
50	24.9	22.3	2 6	10.4
75	21.7	19.2	2.5	11 5
100	19.1	16.6	2.5	13 1
150	16.7	14.2	2 5	15.0
200	14 6	12.2	2.4	16.4
250	13 2	10.8	2.4	18.2
500	10.0	7.6	2.4	24.0

in between. (See column 5.) For the lower average stockholder incomes where the absolute amount of earnings for distribution is small, the exclusion, which gives more relief per dollar of dividends, far outweighs the credit in importance. Hence the relatively high degree of relief observed. Near the top of the income scale the strength of the relief is explained by the fact that the differential against earnings for distribu-

tion becomes steadily smaller as the size of stockholder income increases, while the absolute amount of relief is substantially the same as at lower income levels. (See columns 2 and 4.)

In summary, our major conclusion is that the relief provisions of the Internal Revenue Code of 1954 are inappropriate measures for the hardship they seek to alleviate. They are not geared directly to the basic feature of this hardship; viz., that it becomes increasingly less severe the higher the marginal personal income tax rate to which stockholders are subject. It is true that because of the relative weights assigned the exclusion and tax credit, we do find that the absolute amount of relief (measured in percentage points) is greatest at the smallest incomes and least at the top of the income scale, and that for "representative stockholders" in the lower portion of the income range the relative degree of relief is higher the greater the need for it. But, over the rest of the income scale, from about the $15,000 point on up, the opposite condition exists: the less stockholders need it, the greater the degree of relief they obtain.

One final comment. Were Congress, at some time in the future, to continue to step in the right direction and increase the exclusion and/or tax credit, complete removal of the differential burden could be accomplished for stockholders at only one income level. Those below this point would remain overtaxed; those above this income level would be undertaxed. As a corollary point, it must be recognized that if the relief afforded by a given credit and exclusion level is deemed satisfactory and just, any change in the corporate income tax rate or personal income tax rate schedule would disturb this equilibrium and necessitate a readjustment of the size of the exclusion and credit.

THE INDIVIDUAL INCOME TAX AND INCOME DISTRIBUTION

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The effects of the individual income tax upon income distribution have been made the subject of increasing attention in recent years. Pechman's recent study and the detailed analysis of the upper income groups by Kuznets have substantially increased our knowledge in this area. Musgrave and others have made useful estimates of the distribution of the tax burden among income classes. In almost all these studies[1] emphasis has been placed upon the effect of the individual income tax upon the aggregate income distribution. In this paper I propose to consider some of the effects of the income tax upon individuals with equal incomes and the consequences of the uneven impact of the tax upon both the final income distribution and the equity with which the progressive rates apply. Although equity, in the sense of equal treatment of persons with equal incomes, is generally conceded to be an objective of the income tax, the bias toward more equal income distribution has tended to minimize the attention given the gross discrimination possible under the law as it now stands. It is the contention of this paper that current practices are so bad as to seriously weaken the income tax as a means of income redistribution and to threaten its future as the largest single source of federal revenue.

The individual income tax has been long considered one of the most effective instruments of taxation because, in addition to its use as a means of equalizing incomes, it has the advantages of countercyclical flexibility, relatively certain incidence and the ease with which it can be adjusted to take account of family size, and other considerations which seem to bear upon taxable capacity. As a result, the increased use of this source of federal revenue has been generally favored. In the relatively short period since 1913, the yield of this tax has increased so that it now produces approximately 45 per cent of all federal revenues. This has been accomplished by raising the rates applicable to individual incomes and greatly increasing the tax base by drastically lowering the value of the individual exemptions. The importance of the reduction in exemption levels is illustrated by reference to the increase in number of returns from approximately four million in 1934 to

[1] Joseph A. Pechman, "Distribution of Income Before and After Federal Income Taxes, 1941 and 1947," *Studies in Income and Wealth*, Vol. 13 (New York, 1951); Simon Kuznets, *Shares of Upper Income Groups in Income and Savings* (New York, 1953); R. A. Musgrave, J. J Carroll, L D. Cook, and L. Frane, "Distribution of Tax Payments by Income Groups: A Case Study for 1948," *Nat. Tax Jour.*, March, 1951, pp. 1-53.

approximately fifty million in recent years. It can now be said that there are relatively few gainfully employed who do not have to pay some income tax.

A superficial review of the change in the relative role of the individual income tax suggests to many that substantial progress has been made in achieving justice in the distribution of the tax burden as among equals. Although there is a very vocal group which insists that the equalization aspects of the income tax have been carried too far and have led to the destruction of work incentives and investment incentives, no objective analysis of this question can produce evidence to support their contentions.[2] Some qualifications about the adverse long-run implications of continued high rates upon incentives have been made but the extraordinary prosperity and investment boom which has characterized the period since the income tax schedules have reached record levels is evidence that the fears of the opponents of the tax are exaggerated to say the least.

What *is* of concern is that at the same time that the individual income tax has grown to play such an important role in our revenue system it has been made increasingly arbitrary and erratic in its application. As a result, the progressivity of the tax is more apparent than real. Thus, although much is said about the severity of the marginal rates, the recent Harvard studies of top executives bring out the fact that when net capital gains are included in income no one of them paid as much as 50 per cent of his true income in taxation in 1946 and that progression stops at approximately the $50,000 level.[3] It should be noted that these computations are made from Treasury tabulations and do not allow for such items as tax-exempt interest, percentage depletion in excess of cost, and personal consumption expenditures deducted as business expense.

An analysis of the reasons for the difference between the apparent severity of the tax and its actual impact will be considered below. It is important to realize that as now applied the individual income tax is not as effective an instrument of income redistribution as generally believed and that the results of the uneven application of the tax may seriously distort the way in which business is organized and the channels into which investment funds are directed. (J. Keith Butters, *op. cit.*) If these trends toward the emasculation of the income tax continue, there is danger that the cumulative reaction against the arbitrary and capricious application of the individual income tax will destroy its effectiveness. One danger is that there will be a marked increase in

[2] J. Keith Butters, "Taxation, Incentives and Financial Capacity," AEA *Papers and Proceedings*, May, 1954, pp. 504-519.

[3] J. Keith Butters, Lawrence E. Thompson, and Lynn L. Bollinger, *Effects of Taxation, Investments by Individuals* (Boston, 1953), pp. 85-89.

evasion and noncompliance, further aggravating the difficulties we now face. Another danger is that the current tendency of Congress to extend the avenues of avoidance and legal escape will be accelerated.

Before the extent of the deficiencies of the individual income tax are described in detail, the distinction between this analysis and that usually found in general discussions of the effect of the income tax upon income distribution must be made clear. In the usual study, the sole objective is to describe factually the manner in which incomes are distributed before and after taxes. Although an attempt is usually made to adjust the income concept used to take account of certain limitations of the tax law, averages for each income class are used and no attempt is made to indicate the range of tax liabilities to which individuals of the same income class may be subject. There is usually no attempt to measure the extent of avoidance of income tax liabilities. Most studies exclude net capital gains from income so that the data will conform to the concept of income used for purposes of national income measurement. In no case do estimates adequately take account of the influence of accrued income—particularly realizable but yet unrealized capital gains and losses! Similar deficiencies exist in the estimates of net income due to questionable use of expense allowances and other deductions from gross receipts. Thus if, as is the contention of this paper, the effect of existing tax law and administration is to encourage taxpayers to find means of reducing taxable income without substantially reducing their real income, all estimates of changes in income distribution in recent years must be qualified to the degree this has been true. If, as also is the contention of this paper, the possibilities of avoidance of taxation are more extensive in the upper income brackets than in the low, studies based upon income tax returns will show an artificial income distribution both before and after taxes.

An example of the problem that must be resolved is the finding of Richard Goode that the corporation income tax, which he assumes to rest on the stockholder, is progressively distributed because dividend income is concentrated in the upper income brackets (*The Corporation Income Tax* [New York, 1951], pages 73-97). This is true and will result in a more equal income distribution pyramid after taxes. The point here emphasized is that the effect of the corporation tax will still be of concern to the low-income individual who has dividend income and of little concern to the high-income individual if his income does not include dividends. The general tendency of a tax to equalize incomes does not relieve nor in any way satisfy the individual in low brackets subject to a heavy burden while his neighbor may be escaping the burden entirely. Both the general progressivity of the corporate tax and its

possible discriminatory effects are significant but one does not cancel out the other.

Sources of Discrimination. There are two major sources of discrimination in the distribution of the individual income tax burden. First is the discrimination which results from the uneven enforcement of the tax law. This is a problem at all income levels and can be related to source of income and occupation more certainly than income level. Thus while the wage earner and salaried worker subject to deduction at the source pay on almost all their income, the farmer, dividend recipient, professional man, and small businessman are all evaders of the income tax to a much greater extent.

Both available data and the well-known emphasis of the Bureau of Internal Revenue upon the auditing of the returns in the upper income brackets suggest, however, that this problem is greatest at the middle- and low-income levels. Few taxpayers in the top brackets can consistently fail to report reasonably accurately their total taxable income. The more complete records and accounting systems which are maintained by both large-scale business and the upper bracket taxpayer are also conducive to better reporting and enforcement by the Bureau.[4] We may conclude that the underreporting of income for tax purposes, although serious and not entirely confined to any one income level, does not seriously change the impact of progression of the income tax. On the other hand, the sharp discrepancies between the compliance of the farmer, the small businessman, and other self-employed and professional workers and wage and salaried workers can be just as disturbing and seriously threaten the effectiveness of the income tax. To add insult to injury, the use of the standard deduction of 10 per cent tends to make the income tax a gross tax for wage earners with the sole advantage provided by personal exemptions.

The second and more important source of discrimination reduces both the progressivity of the tax and the equity of its application. In this category are the exclusions from income and differential rates of taxation of income from certain sources. Certain of these features of the law are of advantage to only top-income brackets or individuals with substantial property income. The effect in these cases is to reduce the extent and severity of progression at the same time that equity is being violated. In other cases the opportunity to realize the possibilities of tax avoidance is a function of the type of employment or employer, the industry, or even the section of the country in which one lives. Some—and in recent years an increasing number of possibilities—are

[4] Selma Goldsmith, "Appraisal of Basic Data Available for Constructing Income Size Distributions," *Studies in Income and wealth*, Vol. 13 (New York, 1951), pp. 266-327; Simon Kuznets, *op. cit.*, pp. 435-468.

restricted to the aged or related to marital status. The list of possibilities is well known and at this time of year brought to one's attention by tax advisers, investment analysts, and others trying to share some part of the special privileges open to the taxpayers.

Among the important means of reducing the tax burden in the top brackets are the following: tax exemption of state and local bonds, the maximum rate of 25 per cent applied to capital gains realized after six months' holding, percentage depletion, income splitting for married couples, family partnerships and trusts, differed compensation plans and pension plans, stock options, and, finally, the expense account. All income levels can benefit from the following means although the bias in favor of the wealthy is less clear. In every case the possibility is open to only those taxpayers fortunate enough to have income or property in certain forms. The possibilities include: tax exemption of most income in kind with special emphasis upon the rental value of owner-occupied homes, the deduction of mortgage interest, pension and health plans paid for by the employer, fringe benefits if they are not realizable in cash, and, finally, the growing favors extended to those over sixty-five.

As Stanley Surrey has pointed out, "we have a large number of separate tax rates on the books which in combination produces effective rates of tax which are nowhere near what you would expect when looking at our surtax tables." And, also, that "the executive has his stock option, his pension arrangement, his deferred compensation arrangement, and his expense account. The investor has the capital gains rate for his securities and even tax exempt securities along with percentage depletion for his tax exempt oil holdings and capital gains for his coal royalties. The farmer has his livestock sales. Certain partners have splitting of income with their minor children."[5]

Although each of these avenues of tax relief deserves detailed analysis, the limits of this paper prevent more than a cursory treatment. Perhaps the most important quantitatively is capital gains, as it has the double-barreled effect of both reducing the tax on realized gains and permitting the permanent and complete avoidance of any taxation on gains that are never realized but become a part of one's estate. It is here assumed and asserted that capital gains should be included in the concept of taxable income. L. H. Seltzer has presented the most compelling evidence upon this point in his monumental study of the question (*The Nature and Tax Treatment of Capital Gains and Losses,* [New York], 1951). Even if some reservations are still maintained

[5] Statement as discussant at Congress of Industrial Organizations *Conference on Taxation,* Washington, D.C., October 16, 1953, pp. 42-44; and "Policy Issues in Federal Taxation," *Current Business Studies,* No. 10 (Trade and Industry Law Institute, Inc., 1951), pp. 20-29.

on this point, the general acceptance of the market and the professional tax adviser of the fact of many possibilities of conversion of ordinary income into capital gains makes the issue one of major concern for the purposes of this paper. The general assertion of the national income specialists that capital gains cannot be included in economic income must also be questioned on these grounds.

Along with capital gains must also be included undistributed profits of corporations. These have grown in recent years to proportions unheard of in previous periods—in part, as the result of the advantage to top-bracket taxpayers. In the case of the family corporation the possibilities of tax avoidance are most clearly found. Although the law provides for penalties if the retention of earnings is for purpose of tax avoidance or is unreasonable, the record indicates that this has not proved to be an effective method of preventing the widespread use of the corporation as a means of tax minimization. The importance of the family corporation may decline as a result of the explicit legalization of the family partnership, but the large corporation will probably continue to find it acceptable to its shareholders to retain large sums.

Both effects have been subject to some analysis and the results indicate that a signficant variation in the distribution of income before and after tax will result if either one or both are included within the concept of income. As George Garvy has pointed out ("Functional and Size Distributions of Income and Their Meaning," AEA *Papers and Proceedings*, May, 1954, page 246), Kuznets' estimate of the reduction in the share of the total income going to the top 1 per cent between 1939 and 1946 is nearly halved if realized capital gains are included within the income concept (reduced from 2.82 to 1.60 percentage points) and the decline in the top 5 per cent is reduced by one-third (from 5.25 to 3.63 percentage points). It is therefore true that the sums involved are significant for both total revenue realized and its effects upon income distribution. A large and unknown quantity of gains never realized but accruing to the taxpayer must also be mentioned. Due to the failure of the income tax law to require a final settlement of accrued gains on death, these gains can never be accounted for in spite of the fact that the assets involved are valued for estate tax purposes. The donee uses the estate tax valuation as his basis for future gains and of course may transfer the assets again on his death without payment of tax. When the differentials become so attractive as they now are between the capital gains maximum of 25 per cent and the marginal rates applicable to normal income, the continuance of this form of tax avoidance can be expected. Further opportunities have been offered the taxpayer in certain selected cases. These include the granting of capital gains treatment to coal mine

royalties, to farmers on the sale of livestock held for breeding purposes, and to certain stock dividend arrangements.

The extension of the means available to minimize one's tax burden has been a slow but steady process. Not only do the wealthy find means of escape but organized labor, the farmer and the aged are fast catching up. The recent study of J. H. Guttentag, E. D. Leonard, and W. Y. Rodewald of the taxation of fringe benefits indicates the growing importance of this avenue of escape as well as the complexities of dealing with the problem ("Federal Income Taxation of Fringe Benefits: A Specific Proposal," *National Tax Journal,* Vol. VI, No. 3, September, 1953, pages 250-272). Garvy estimates that employer contributions to health and welfare plans alone have increased from 156 million in 1939 to nearly 3.5 billion dollars in 1952. He states that, "together with employer contributions to social insurance funds which are excluded from personal income, they now exceed the monetary interest and the monetary rent components of personal income." (*Op. cit.,* page 243.) When deferred compensation of executive personnel and the growing use of pensions as a measure of tax reduction are considered, we must conclude with Garvy that "the question might be raised to what extent the drift toward equality, which the size distributions for this country show unmistakably, represents changes in the timing of the compensation for services rendered rather than changes in the earning capacity of factors of production." (*Ibid.,* page 244.)

Other students of the trend toward the relief of certain taxpayers have come to conclusions similar to mine. L. H. Seltzer believes that "few persons like to see a baseball game in which there are no runs, no hits, and no errors; or a football game in which no one makes a touchdown. Many congressmen and other persons have a similar feeling about the tax system and the chances of achieving outstanding success. They do not want an airtight tax system. They want to preserve the opportunity for a man to make a financial home run, a touchdown, a killing. The preferential treatment of capital gains has the virtue, in their minds, of offering just such an opportunity." ("Capital Gains and the Income Tax," AEA *Papers and Proceedings,* May, 1950, page 378.) Surrey generalizes somewhat more in his conclusion that "Congress introduces these various low rates maybe because Congress doesn't really accept the principle of progression in the upper brackets. . . . The result is, however, a complete distortion equity-wise among the upper bracket taxpayers. Some do pay these high rates and some don't, even though the average is less than a 50% effective rate." (Congress of Industrial Organizations, *Conference on Taxation,* October 16, 1953, page 43.) Colm finds that "the high rates are largely ineffective because our system has shown its ingenuity in legal tax

evasion and shifts a great deal of luxury comforts of businessmen to expense accounts, thereby making ineffective some of the high rates." (*Ibid.*, page 5.) Walter Heller sums up the indictment neatly as follows: "But growing erosion and corrosion of the income tax base is increasingly raising questions of how far we can extend our reliance on this form of taxation." (*Ibid.*, page 23.)

A final point must be made with regard to income splitting. This feature of the income tax law, introduced in 1948, was designed to prevent a serious and growing inequity in the treatment of married couples in community property and noncommunity property states. The problem became acute when Pennsylvania and some of the other eastern states changed their property law to open this tax haven to their residents. As a result, we now give to all wives a capital value. If any in my audience are still single, I commend to you the computations of Ludwig S. Hellborn. He has estimated the value of the dowry brought to every husband by his wife or, in economic terms, her cash value under the terms of the 1951 law. If your annual income is $5,000, she is worth $11,720. If you have a $10,000 income, she brings you a reduction in annual tax which can be capitalized at $41,360. At $50,000, she becomes worth over a million dollars and may be worth as much as $11,457,000 if your income is $309,000. After this point her value decreases steadily until she becomes worthless, for tax purposes, to a man earning over $1,224,000. ("Uncle Sam's Dowry," *National Tax Association Proceedings*, 1951, pages 310-314.)

This problem is not easily resolved, but the present discrimination against those who choose to remain single has not been solved by either the extension of income splitting advantages to heads of households or the recent and perhaps not unconnected increase in the proportions of the population who have chosen the joys of marriage over the costly freedom of single life.

The Effects of the 1954 Code. Much has been said about the 1954 Revenue Act which for the first time in many years attempted to recodify the basic tax legislation of the nation. This commendable objective was completed within record time but with unfortunate results in the area under investigation. Perhaps the objective of the act was not to promote greater equity in the taxation of equals but it must be judged on these grounds as well as the results achieved in clarification of the law. It is clear that the chemistry of the process of working out the new tax code between the Treasury and Congress resulted in a low valuation of equity in the sense used in this paper. A quick review of the new act indicates that none of the major devices for minimization of taxation has been removed—in many cases they have been extended—and the law has opened some entirely new avenues of escape.

Some of the major sins of commission will be discussed below. The first is the much debated dividend credit which permits the first $50 to be excluded and 4 per cent of the balance of dividend income to be deducted from the tax after the inclusion of all dividend income in the tax base. Although small, this provision gives tax relief of equal value to all brackets. However, as Daniel Holland points out in his paper, the discrimination arising out of the "double taxation of corporate income," if indeed there is real discrimination, declines as the individual reaches higher brackets. One can also complain that although the flat amount deductible may be justified on grounds of administrative convenience and realistic enforcement criteria, the sum available to husband and wife is $100 and is increasingly valuable as family income rises.

The provision of extra exemptions for taxpayers over sixty-five is continued in the new law, and an additional tax allowance of $240 is granted to sweeten the pot. Thus a married couple over sixty-five now receive $2,400 exemptions—a tax credit of $240 above this and the usual standard exemption. In other words, they will not pay any income tax if their retirement income does not exceed $4,000. The advantages of age are further extended by complete exemption of social security payments, and other special provisions for certain types of retirement income. Further relief is granted by extending annuity deductions to recipients who live beyond the period when their capital has been returned. Although this again has the rationale of eliminating a provision of the law confusing and difficult to enforce, the new provisions are even more complex than the old. I find it difficult to justify this trend when the contrast between the position of the older group and those just starting out in life is made. The latter group has little stock to draw upon and cannot wisely expend what little capital they may have. The aged, on the other hand, may well have complete furnishings of a home, adequate clothes to last their lifetime, and can and do expend their capital by purchase of annuities and other means. To claim that the aged have less taxpaying capacity than the young with equal income is a gross miscarriage of justice. The rule of expediency is the only possible justification for the special favors granted. The desire of those who are forced to retire to live more nearly as they had been able to before their reduction in earning power explains the appeal to the aged. But all of us wish to live better or have larger incomes than we do, and it is my guess that if the intensity of the yearning for better things could be measured the young could out-yearn the aged any day. The aging of the population—which is now certain as the result of increased life expectancy and the maturing of the high birth crops of past years—makes this development one of growing significance.

A sore spot for many years past has been further extended by the action of the Congress in the area of percentage depletion. The extension of this feature of the law in 1951 has been continued by both more specific inclusions of certain extractive industries in the high percentage categories and especially the transfer of uranium and a list of some thirty-five domestically mined metals and materials from the 15 per cent to the 23 per cent category along with the long-privileged sulfur. The base for computation of percentage depletion is also somewhat extended, to include as a part of gross income certain treatment processes for talc, magnizite, coal, and phosphate rock. The final extension includes the raising of deductible mine exploration expenses from $75,000 to $100,000. It is of some interest to note that in the case of the granting of the 23 per cent rate to new areas and raising of the exploration expense allowance it was the Senate that took the initiative after the bill had passed the House of Representatives. The Texas plutocracy is still with us, and it looks as though they might be able to dig in and make several more millions before their favored position is brought to an end by public reaction.

Not only mining interests have been able to win special favor. Lumber operators are given capital-gains privileges on net proceeds and the royalties from coal are also given this favor. In the case of coal, the basis for computation of gains is increased in the new code by permitting certain expenses to be included, thus reducing the tax.

We may conclude that in spite of the real accomplishments of the new code in the area of clarification of existing provisions and the prevention of certain abuses due to the lack of clarity in the law, the net effect has been to extend, aggravate, or otherwise enhance the opportunities for tax avoidance.

In all fairness, one must remember that Rome was not built in a day, nor the income tax law destroyed by a single Congress. Most of the difficulties cited above are the responsibility of other Congresses under the leadership of other administrations. Nevertheless, the current outlook has been made more pessimistic by virtue of the failure of the new legislation to correct any of the major shortcomings of the law. When so much emphasis was placed upon the complete revision of the tax code and the desire to develop an integrated law, the results cannot but be disappointing.

Conclusions. It is my conviction that many of the difficulties and inequities of the law as now applied cannot be removed without new and rather radically revised leadership from those who really favor the achievement of an equitable, progressive tax system. I believe that we must face the fact that confiscatory rates of taxation are not acceptable. It is probably true that as long as nominal rates of 70 per cent

and up are continued and they apply to any large number of taxpayers, Congress will continue to provide means of escape. When the possible inequities and real incentives to change business methods which follow from current practices are taken into account, the case for a major drive to clear up this situation is made compelling. It is the suggestion of many—which I share—that if the law were revised to prevent wholesale avoidance, a substantial reduction in top-bracket rates could be accepted in return. This position is further supported by the realization that expenditures on welfare programs can more effectively reduce the sources of inequality of income than can the income tax and at the same time help to increase the total national product.[6] Let us not kid ourselves about the effectiveness of the top-bracket rates. Let us remember that a truly effective income tax with more modest pretensions is worth more than one riddled and weakened for political reasons. It seems to me that the choice now before us is between the salvage of the income tax and the return to a greater dependence upon indirect taxation. The continued threat of a new mobilization program or even the outbreak of war makes immediate action most desirable. Our financial position will be greatly strengthened if these problems were resolved before a new emergency arises. No tax law can be perfect. It is clear, however, that few can be as bad as the current income tax law and still command the respect of any intelligent citizen or economist.

[6] Allan G B. Fisher, "Alternative Techniques for Promoting Equality in a Capitalist Society," AEA *Papers and Proceedings*, May, 1950, pp. 356-368

DISCUSSION

Walter W. Heller: It is not often that one encounters on one program two papers of such a basically different nature as the two we have enjoyed. Mr. Holland's is essentially a report of findings of painstaking statistical research, supplemented by an appraisal of the new dividend credit in terms of those findings. Mr. Strayer's, in contrast, is a broad-gauged survey of the personal income tax, based on analysis, intuition, and previous research findings. From it, also, policy implications are drawn. It is noteworthy that at the single point of intersection of the two papers, namely, the dividend credit, the two speakers join forces. Both conclude that it is ill-suited to overcome the inequities of our present system of taxing corporate earnings.

Mr. Strayer puts his misgivings about the dividend credit in a broad context of concern, not to say alarm, over the growing inroads on our federal income tax base. I am sure that many of us share his alarm and welcome his well-focused statement of the issues involved. His review suggests ample cause for action to prevent further deterioration and to restore pieces of the base previously chipped away. However, before engaging the forces which are undermining the income tax base, one might be well advised to test not merely their strength but also the rationale of the concessions they seek. Granted, preferential tax treatment offends the dogma of impartiality—"the equal treatment of equals"—which we of the public finance brotherhood hold dear (and rightfully so). But perhaps there are other admissible, even supervening, social and economic ends to be served by the income tax which conflict with our dogma.

Reviewing the whole array of discriminatory features that Mr. Strayer has placed before us, we find that our federal income tax rates, in practice, run from zero on tax-exempt bond interest and imputed income, to preferential rates on capital gains and income from exploitation of mineral resources, to full rates on wage and salary income. To the extent that differentials are the result of disparities in administration (the income tax appears to be about 95 per cent effective on wage and salary income, 75 per cent effective on dividends, and considerably less than that on interest, rentals, and farm income), the discrimination is irrational and indefensible. Rationality begins to enter when we encounter exclusions of imputed income, substitution of standard for actual deductions, special rules on dependents' incomes, and so on. Here, equity stands aside for simplicity of compliance and administration. A desire to stimulate or protect certain types of production and investment—e.g., in enterprises in foreign countries, in oil and gas exploitation, and in risky undertakings generally—motivates other deviations from the rule of equal treatment of equals. Broad social considerations motivate tax differentials between persons above and below the age of sixty-five (through extra exemptions and retirement credits) and between two single people and a married couple with identical incomes (through income splitting).

In reflecting on these departures from "impartiality," each of us would probably admit into his own "ideal" income tax structure some tax differentials

arising out of administrative, economic, and social considerations. The moment we do, of course, we acknowledge the fact that we are in the realm, not of absolute standards, but of a value consensus. Our dogma must make room for careful evaluation of the ends sought by preferential tax treatment, the likelihood that such treatment will achieve these ends, and the price paid in violations of "horizontal equity." In the case of tax concessions to stimulate desired economic activity, for example, one might ask: How large is the marginal social benefit, if any, and what special tax benefits have to be conferred on the favored group, and at whose expense, to achieve it? Where the tax concession involves a large subsidy to special-interest groups but only small third-party benefits, the path of virtue is clear. But where tax differentials do in fact influence resource allocation or income distribution in accord with accepted economic and social objectives, the decision may be more difficult. Granting, then, that the cause for action to restore the income tax base is compelling, one would do well to proceed only after a careful weighing and balancing of benefits and costs.

Turning to the findings of the Holland paper, one may examine them in terms of what they contribute to our knowledge on the taxation of corporate earnings and to the resolution of policy problems and conflicts in this field.

On the first point, previous studies like Richard Goode's 1946 survey for the US Treasury, *The Post-War Corporation Tax Structure,* have shown by arithmetic how the unintegrated corporate-individual income tax overtaxes those in the lower and middle income brackets and undertaxes those in the higher brackets. Illustrations have been developed to demonstrate the impact of varying tax rates and percentages of corporate earnings retention on the amount and pattern of differential taxation. In some cases, *Statistics of Income* data have been used to provide rough approximations of actual distributions and inequalities.

Mr. Holland's excellent study substitutes statistical measurement and precision (within the confines of his assumptions) for arithmetic and approximation. Adopting the central assumption that the corporation income tax rests on profits, limiting his study to taxable dividend recipients, and using the partnership treatment as the criterion of differential taxation, he tells us the following important things about taxes on stockholders: (1) who, by income brackets, was overtaxed and who undertaxed and by how much on the average; (2) the changes in the "crossover income-points" (from overtaxation to undertaxation) during the 1940-50 decade under the impact of shifting relationships (not summarized by Holland in his paper, unfortunately) between corporate and individual tax levels and between retained and distributed earnings; (3) the total number overtaxed (96.8 per cent in 1950) and undertaxed (3.2 per cent in 1950) and what percentage of corporate earnings fell in each category (54 per cent overtaxed; 46 per cent undertaxed); (4) the net overtaxation of stockholders in the aggregate as measured by the revenue that would be lost in shifting to the partnership method (for 1953, 5.7 billion dollars currently plus 1.1 billions in the future); and (5) how the 1954 dividend relief provision affects the pattern of differential taxation.

In short, Holland has greatly strengthened one link in our data chain by quantifying and verifying the tax differentials between dividend recipients and other taxpayers. There are, of course, many other links that must be strengthened before the full dimensions of the problem can be measured as a basis for policy decisions. Three of the important questions that might submit to analysis and statistical inquiry—at least in greater degree than they have to date—are the following: (1) What is the incidence of the corporate income tax; i.e., how much of it is passed forward to consumers and backward to productive agents or absorbed via capitalization by the present owners of stock, thus diminishing the controversial "double burden" on stockholders? (2) What is the amount and pattern of the greatest relative overtaxation of corporate earnings; namely, that which falls on tax-exempt individuals and institutions? (3) What are the actual burdens that fall on undistributed earnings via capital-gains taxes on stockholders?

The first and third of these are exceedingly tough research nuts to crack. Perhaps we lack the tools needed to crack them. But they do raise this question about allocation of available research resources: do we gain more by turning a bright, well-focused light on a segment of the problem that is already fairly well illumined, or would it be better to shed even a little light on the dark, murky corners of the problem that we now submerge in our assumptions? This raises the basic question of what criteria should guide us in allocating research resources. To achieve the optimum allocation requires an accurate balancing of net research products against opportunity costs of various projects. Even with the benefit of hindsight, this balancing process is bound to be inexact. The Holland contribution will undoubtedly be cited as authoritative in its area of inquiry for years to come. Perhaps one should ask no more.

When one turns to the second question (that of what research of this kind can do to resolve the controversy and clear up the misunderstandings to which Mr. Holland refers at the outset of his paper), one finds little basis for optimism.

To resolve controversy in this area requires nothing less than agreement not only on fundamental value judgments concerning the definition of horizontal equity and preferences as to vertical equity, or progressivity, but also on the relative role of incentives and markets in tax policy. These are differences which will not submit to analysis and statistics.

Even without entering this arena of inescapable differences in value preferences and economic persuasions, one is dismayed to find how sharply authorities can differ in their readings of a given set of facts. Thus, Holland concludes: "The tax credit, by providing a constant amount of relief at all income levels, operates in such a way that a greater degree of relief is obtained the higher the stockholders' income level. . . ." Yet Dan Throop Smith, speaking to the National Tax Association last September as a Treasury representative, concluded: "The adoption of relief in the form of a credit . . . gave greater proportionate relief to lower bracket taxpayers." Each has looked into his mirror on the wall, asked which is the fairest of them all, and emerged with answers bearing no resemblance to one another.

Apart from disagreements as to the meaning of available data, one finds

many dissenters from that interpretation of horizontal equity which regards the partnership treatment of corporate income as constituting equal treatment of equals. Those, for example, who regard corporations as more privileged by law than partnerships (because of limited liability, with the implicit residual cost it imposes on society as a whole) may consider differential taxation of corporate earnings as quite consistent with horizontal equity. This would in no sense invalidate Holland's careful work, but would require relocation of his crossover income points to fit individual convictions as to justifiable differentials.

A desire to remove differential taxation may, of course, be quite secondary to distributional and incentive considerations. In recommending a 15 per cent dividend credit, President Eisenhower stated: "This will promote investment which in turn means business expansion and more production and jobs." By identifying more reliably the beneficiaries of dividend tax relief, the Holland study provides a better basis for forming judgments as to possible impacts on investment. But, like most tax research, it is designed to inform the policy-maker rather than to make decisions for him.

This point applies even more forcefully to interpretations of vertical equity. Many of us would agree with Paul Strayer that the largely artificial rates above, say, 70 per cent involve a net loss in terms of distorting incentive effects, stimuli to avoidance and evasion, and unnecessary increments to tax lawyers' incomes. One may safely surmise that this view is shared, probably with some intensity, by the Treasury team of today. Yet, even though the revenue loss from a cut-off at 70 per cent would be less than a half a billion dollars, a frontal assault on the unrealistic top brackets is politically ruled out. ("Only the Republicans can recognize Red China and only the Democrats can adopt a sales tax.") If this be true, an attractive "second best" is to reduce the tax on those components of income which are most unequally distributed. Very considerable progress has already been made along these lines in the capital-gains area. Dividends would clearly be next in line in carrying out such a policy.

This is not to say that lessened progressivity was the prime object of dividend tax relief in 1954. But the action recommended was not inconsistent with this aim. And since methods which are inconsistent with it were rejected even though they would have done a superior job of removing tax differentials (e.g., the withholding method or the corporate dividend credit), one may reasonably conclude that distributional preferences played a considerable role.

Research is indeed indispensable to policy. But the paths from sound statistical research to sound economic policy are seldom straight and narrow.

RICHARD E. SLITOR: Dr. Holland has given us a very thoughtful and lucid preview of his National Bureau of Economic Research study on the combined burden under the corporate-individual tax structure. His findings and analytic contributions will be of real interest to students of taxation, particularly those concerned with the problem presented by an unintegrated corporation-individual income tax system. In the development of its conceptual frame-

work and in its technical craftsmanship, his paper reflects penetrating analysis and skill in an unusually complex and difficult area of applied economics.

Before proceeding further, I wish to make clear that my comments on his paper will be technical and philosophic in character and are not intended in any way to assert or defend a particular policy view on corporate taxation or the double-taxation problem. For reasons which will readily be understood, including the degree of circumspection proper to a civil servant, I am not in a position to examine the rather direct criticisms and recommendations respecting practical tax policy which appear in Dr. Holland's discussion. I can only observe that there seems to be some inconsistency between the careful caveats and reservations at the beginning of his paper where he states flatly that his findings are highly qualified, "valid only within the premises and technique used in their derivation," and the subsequent free-wheeling conclusions where—if he does not throw caution to the winds—he indulges in some fairly uninhibited policy judgments.

My comments on Dr. Holland's paper will deal with three separate points: (1) the major thesis or objective of measuring the combined corporate individual tax burden viewed as a tax on stockholders, which establishes the theoretical framework of the study, (2) the underlying assumptions about incidence, imputation, and investor behavior which go into the development of his findings, and (3) certain procedural aspects.

His study derives its basic inspiration from the idea that the corporate income tax is a kind of personal withholding tax at source on corporate profits. This in itself is a kind of assumption which involves related questions of the rationale of the tax, the economic separateness of the corporation and its stockholders, as well as matters of shifting, incidence, and imputation. Of course, the study may be regarded as a mere pursuit of an extreme set of assumptions to their logical conclusion. But, in practice, the treatment given it, including the author's readiness to draw practical policy conclusions from the results, suggests that the study is more than an exercise in the systematic exploration of certain postulates and premises, but is considered to be based in substantial degree on the most realistic and fruitful analytic approach and assumptions.

Personally, I have always felt that the role of the corporate tax, historically and conceptually, goes beyond that of an ancillary individual income tax. It is unnecessary to recapitulate here the reasons in support of this view, including the traditional concept of the tax on a separate corporate entity recently illustrated by Colm's "partnership in enterprise" principle, as well as what I have referred to as the special role of profits in a high-level economy bolstered by a government commitment to maintain high employment and economic activity and elements of deliberate partial insulation of business earnings from the full impact of the progressive individual rates. Suffice it to say that, to the extent Dr. Holland's study does not embody a realistic concept of the role of corporate taxation, it produces results which, however interesting on other grounds, are not entirely relevant to an appraisal of the actual performance of the corporate tax.

The assumed economic identity of the corporation and its stockholders

involves one of the fundamental unresolved questions not only of taxation but also of other branches of economics. Economists are divided into camps and occupy various intermediate zones of no man's land, depending on whether, or the extent to which, they see through the corporate veil. The particular position taken in the study, therefore, must be taken as a semiarbitrary selection of a particular premise.

It may be answered that, regardless of the conceptual role of corporate taxation, the differential burden with respect to stockholders may be measured on certain assumptions of incidence and imputation of retained earnings. But, in fact, the conceptual role and the assumptions are merely opposite sides of the same coin.

Holland handles the difficult question of incidence with alternative assumptions (except in his partnership-method revenue estimates, where an alternative to 100 per cent incidence on stockholders would modify his conclusions). Certainly he deserves great credit for his refusal to be bemused by apparently conflicting, chaotic views on the incidence problem, judgment on which has threatened to become, in his words, "a matter of taste, not economic analysis." Both from his preference for the standard arguments against shifting and from other indications, I have the impression, however, that he oversimplifies the situation by implying that there is a single, unchanging rule of incidence if it could only be discovered, although opinions on it in the present imperfect state of knowledge differ widely. It seems fairer to recognize that the nature of corporate tax shifting and incidence, or what is left of the concept in the modern macroeconomic setting, varies from situation to situation, with the varying shades of competitive or semimonopoly conditions, and from time to time over different phases of the economic cycle.

If this is true, Holland's assumption of 100 per cent incidence on the stockholder should be treated as a logical extreme and the alternative of 50 per cent incidence at best as a conglomerate average. Tax experts are frequently compelled to furnish a practical, clear-cut view on incidence. On such occasions they mutter darkly, perform certain suitable incantations, and come up with some rule of thumb, such as a specified fraction of shifting, backward or forward. These generalities are sometimes useful, but there is a world of difference between their expression as desperate generalizations and their systematic application to the task of detailed burden measurement in the manner of Holland's study or the more general study by Musgrave and others several years ago.

The imputation of retained earnings to stockholders, which is equally germane to Holland's major thesis, is one which he places on a basis which I consider unrealistic. Such imputation is especially unrealistic in the case of shareholders in large publicly-held corporations, whose control over corporate distribution policy is generally ineffective. Market values of stock not only reflect retained earnings imperfectly, but there may actually be an inverse relationship between retention and market value.

Holland presumably defends 100 per cent imputation on the theory that income to the stockholders is what could be distributed each year without impairing the capital of the enterprise. For this purpose, he takes the accepted

tax accounting concept of income, although he outlines alternative calculations based on current as distinct from historical costs in measuring depreciation and inventory adjustments.

The theory that the earnings of a corporation which may be imputed annually to the stockholders comprises the amount which could be paid out if the firm were liquidated at the end of the year disregards the heavy costs which would be involved in such liquidation. It ignores the possibility that retained earnings may be a cost of competitive survival. Whatever the implications of this possibility with respect to the taxable capacity of the corporation, it suggests reasons why retentions are so imperfectly reflected in market values in either the long or short run. The real values may not be accumulated but eroded in the process of competitive attrition of capital.

Even to the extent there are real accumulations of investment capital over the long run, their allocation among a shifting population of stockholders is uncertain and erratic as a basis for annual income measurement.

All these considerations add up to my conclusion that the imputation of retained earnings along with an allocable share of corporate tax on a dollar-for-dollar basis to stockholders is a misleading basis for measuring the differential burden of the corporate tax. If serious doubt is thrown on this imputation assumption, a difficult question arises in regard to the economic incidence of the corporate tax as between dividends and retained earnings.

Recognition is given in Dr. Holland's paper to the ambiguity of imputing retained earnings to the stockholders, in view of the fact that they could not be used for purposes other than reinvestment in the particular corporation unless distributed or realized subject to further tax payment. He outlines an approximate adjustment for the present discounted value of estimated future capital-gains tax liability based on the assumption that seventy-two cents is added to share prices for each dollar of undistributed earnings. This adjustment adds to the tax on retained earnings but does not scale down the "earnings for retention" themselves for purposes of imputation. There is an apparent inconsistency between dollar-for-dollar imputation for one purpose and settling for seventy-two cents on the dollar for capital-gains tax purposes.

In view of the numerous complications, adjustments, and refinements which Dr. Holland has already patiently taken into account, I feel apologetic in mentioning others which he has apparently neglected. One is the process variously referred to as discounting, amortization, or reverse capitalization of pre-existing corporate tax by current investors in stock. To the extent the existing body of stockholders have taken account of the tax in acquiring their stocks, some observers regard them as not actually paying the tax. Of course, current buyers may have been investors in other corporate equity holdings at some previous time when part or all of a given level of corporate tax was imposed and thus have sustained the tax in that guise.

Another neglected complication has to do with the status of preferred stockholders, especially in nonparticipating issues. While the incidence in this situation is confused and controversial, the tax on the earnings dedicated to the dividends on such issues is sometimes considered to be sustained by the common stockholders.

A further complication is the possibility of spreading or diffusion of the differential burden on common stocks over other investments through the equalization or realignment of yields. To the extent such diffusion has occurred, the double-taxation differential exists but is difficult to isolate or quantify. The resulting general lowering of yields on bonds, real estate, and other assets as well as stocks due to the tax would have become a ubiquitous datum, and the impact of double taxation inextricably interwoven with other complex forces determining the market equilibrium.

Turning from the conceptual framework and assumptions to procedural aspects, the effective rates of combined corporate-personal income tax burden as measured in Dr. Holland's study are the composite resultant of a number of factors. These include: (1) the element of withholding or taxation at source at rates substantially above the lower bracket individual rates, (2) the cushioning of the net differential impact of double taxation as income and marginal personal rate increase (the corporate tax "costs" the dividend recipient less the higher his income since his net after personal tax would be correspondingly less if it were distributed), (3) the insulation or short-circuiting of retained earnings from current application of the individual income tax, (4) the retention ratios of corporations, (5) the configuration of dividend distributions in relation to the income level and applicable personal tax rates of the stockholder, (6) the effects of deficit corporations and dividend distributions in excess of current earnings, and (7) the relative levels of the corporate and individual income tax rate structures.

Throwing together all these factors and grinding out the composite averaged results tend both to blur the focus of analysis and to conceal significant diversities. The equity and economic impact of particular tax arrangements must be judged in terms of the range of diverse possibilities and particular cases, as well as the average results. This comment, I am aware, is like criticizing a tiger for its stripes. These are inherent characteristics of the method of Dr. Holland's study. Nevertheless, they indicate its limitations and inadequacies, if it is to be judged as more than a statistical measurement of tax burden distribution on the stockholder group on the basis of certain limited or extreme assumptions.

In outlining his methodology and explaining the major factors controlling his results, Holland provides two guides for more exact determination of the role of each of the variables entering into the impact of the unintegrated corporate-individual tax structure which prevailed in the years 1940-50. The formulas developed in his paper provide the groundwork for a more schematic analysis and are one of the valuable contributions of the study. The breakdown of the composite differential against stockholders into the major component differentials which, together with the related distribution of dividends and other incomes, produce the final results is another helpful interpretative guide.

Still further light might be thrown on the subject by a further schematic analysis showing, for example, the effect of different retention ratios at different stockholder income levels, varying imputation assumptions, and the varying

net differential attributable to the corporate tax under different levels of individual tax and alternative patterns of rate graduation.

Perhaps because of its limited reliance on the schematic approach, Holland's study fails, on the one hand, to make clear certain relationships which comparatively simple computations would effectively bring out. On the other, it goes to laborious lengths to bring out some broad conclusions which are inherent in, and no more valid than, its assumptions. Some of its conclusions reflect familiar relationships which, on the assumptions, could be predicted without great difficulty in advance.

I am aware that some of my comments have gone beyond the immediate scope of Dr. Holland's study and probably reflect some of my own special, and possibly crotchety, views and preoccupations. Certainly they are intended to be at least partially constructive and do not detract from the basic excellence and substantial interest of Dr. Holland's study.

CONCEPTS OF COMPETITION AND MONOPOLY

COMPETITION: STATIC MODELS AND DYNAMIC ASPECTS

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I. *Introduction*

This paper is an attempt at a contribution to the endless effort to reduce or bridge the gap between theory and reality; and in particular the gap between theories of cost-price equilibrium and theories of production, growth, and development.[1] Theory must always be the department of oversimplification; but dynamic simplifications are at least different from static. They include the tendencies toward equilibrium. But because these tendencies never reach their static limits, dynamic theory cannot use any features which are needed only to enable a model to attain this impossibly precise completeness—especially if these features are incompatible with the conditions of progress. It follows that fully dynamic theory is bound to lack certain characteristics which are, to many theorists, the essential earmarks of theory. It must accept indeterminateness, with some margin of individual discretion in business action, and uncertainties of different kinds from those they are accustomed to dispose of by assuming a premium for uninsurable risk. Some of these uncertainties are positive aids to effective—not perfect—competition. If such theory is to be accepted as theory, it seems that the first step which theorists can contribute is the setting up of an appropriate conceptual framework, including appropriate tool-concepts. Even within theoretical writings, many or most of the pieces of this framework exist as scattered fragments; but the writer is not aware that the framework has been assembled and articulated. The present paper is a modest attempt to bring together enough pieces to afford some suggestions of what the structure might look like.

II. *The Point of Departure: Existing Competitive Theory*

In the theory of a generation ago, competition played a twofold role: as an agency to eliminate excessive and exploitive profits and as a stimulus to technical progress—a keener stimulus than monopoly would

[1] The remarkable group of papers presented at last year's meetings of this Association and the proceedings of the 1951 conference of the International Economic Association (*Monopoly and Competition and Their Regulation*, E. H. Chamberlin, editor [London, 1954]) include an appeal for a dynamic theory and confirm the existence of an impressive body of factual material large enough to afford a basis for beginnings at fresh generalizations. They present a challenge to which theory should attempt to respond.

afford. As a stimulus to progress, competition included both the carrot and the stick (the carrot of profits to the successful innovator and the stick of losses for those who fall behind) and elimination for those who fall behind substantially and persistently. Temporary monopoly, under the patent system, was also recognized as a force for technical progress. Later, Schumpeter's theory of innovation made its mark, but without being integrated into general competitive theory.

Subsequent developments, leading to the body of competitive theory now prevalent, have concentrated on more precise definition of the conditions necessary to complete or "perfect" cost-price equilibrium—conditions that turn out to be nonexistent. The model then becomes an analytical device and, as such, a step toward explaining why things do not behave like the model, the next step being to take account of the inevitable departures and the conditions accounting for them. So far, this process has produced certain other models, still highly simplified, of monopolistic competition and oligopoly, with and without product differentiation. The preoccupation of these models with cost-price equilibrium is obvious. What may be less obvious is that static limitations are built into their underlying tools of analysis—demand curves and cost curves—which therefore need modification for dynamic purposes.

This prevalent body of theory is not a theory of production, as growth theory must necessarily be. Insofar as it deals with economy and efficiency of production, it does so in terms of optimum or less-than-optimum scale of production (size of plant or firm) on a fixed long-run cost curve; that is, on the obviously static assumption that the "state of the arts" remains constant.

A more troublesome consequence of the model consists of the normative conclusions that are, rightly or wrongly, drawn from it. As a standard of so-called "perfection," it is one-legged, focusing on the essentially static objective of cost-price equilibrium, to the neglect of the dynamic objectives of progress. This one-legged standard is frequently treated, without warrant, as an ideal. And because it is unattainable, all actual or possible conditions are, by comparison, judged inferior, monopoloidal, or actually monopolistic.[2] This interpretation Chamberlin himself has flatly repudiated, stating that perfect competition is not the ideal, and the ideal includes elements of monopoly—which might mean no more than such elements of uniqueness as most businesses inevitably possess.

The idea of the omnipresence of harmful departures from perfect competition seems to underlie the challenge of Professor Galbraith,

[2] The opposite case—of pure but imperfect competition (e.g., agriculture) which tends to be unduly severe—is commonly neglected.

who says in effect: according to theory, our economy ought to be suffering all the evils ascribed to monopoly; why isn't it? Galbraith suggests that it may be the theory that is wrong rather than the facts of the economy, and this contains much truth. But when he suggests that the trouble with the theory is its adherence to competition and recommends throwing competition out the window in favor of a substitute, he is surely overplaying his hand. I would contend that the trouble with the theory is not its adherence to competition, but its too formalized conception of what competition is. This includes, first, the one-legged character of its standard of perfection, and, second, the fact that its picture of reality is highlighted by models of oligopoly and monopolistic competition which do not tell the whole story about the cases with which they deal, and do not do justice to the competitive forces that exist, including forces of progress and forces working toward serviceable—not perfect—cost-price adjustments. The cases include monopolistic evils, but they also include—more typically, I suspect—cases in which the reality behaves better than the models, including the model of perfect competition, which sacrifices important factors of dynamic progress.

But recognition of this lies under a heavy semantic handicap, if it has to take the shape of stating that the ideal includes "elements of monopoly." This raises questions, not as to the facts, but as to the expediencies of the terminology. It seems unfortunate if economists who defend realistic forms of competition thereby expose themselves to the charge of defending monopoly. This danger is not imaginary. The outstanding case is that of product differentiation—a monopolistic element which has in itself no necessary antitrust significance. I have myself said, of product differentiation (*Economics of Overhead Costs*, page 418): "In a sense each competitor has a monopoly of the difference in quality . . . and this qualified monopoly is a feature of the typical 'competitive' market." I would not say he had a monopoly of his product, but only of the quality differential; and I would not suggest this as standard general-purpose terminology, to be used, among other things, in antitrust connections. With such uses in view, it would appear helpful if, in our general-purpose terminology, "monopoly" began with obstructions to imitation, and "incipient monopolization" began with actions of an obstructive character.

There is food for thought in the discrepancies or contradictions between pure theory and practical or policy judgments. For example, theory appears to regard product differentiation as always a shelter from the rigors of competition; but the Interstate Commerce Commission has apparently found that the element of differentiation between rail and truck transport tends to cause their competition to assume a

cutthroat character. And businessmen recognize that a rival's product innovation can be a very aggressive and formidable method of competition. A manufacturer who has no competitors at his immediate location is not for that reason a monopolist under the antitrust laws; but he must watch his step as to what he does with the element of monopoly resulting from his unique location, under the Staley and other basing point cases. On discrimination and freight absorption, neither theory nor antitrust policy is clear and unambiguous. Excess capacity tends to be treated by theory as a monopolistic symptom,[8] but in antitrust cases it may or may not be so treated, depending on circumstances. And businessmen tend to the view that competition does not begin until they have difficulty disposing of capacity output and becomes more severe as excess capacity gets larger.

The perfect competitive market of theory is one in which prices are identical and each producer knows the others' prices and profits, which implies knowing their costs. In practice, too perfect identity of prices is legally suspect, and so is interchange of information on prices, as in open price associations, or information on costs, or even the use of a uniform cost accounting system. All these cases serve to suggest things which current equilibrium models neglect and which dynamic theory may need to recognize.

III. *Dynamic Criteria of Appraisal*

In the light of the things we want competition to do for us, what are the features it needs to have which are implied in these objectives? I will put first the elements required for progress as being most important, since even a small continuing gain outweighs a substantial gain of the once-for-all variety.

First comes progress in economical methods of production. Under competition, this implies that some take the lead and others follow, while managements are changed or firms are eliminated if they fall too far behind. But an excessive rate of elimination of firms may be unhealthy for an industry. To avoid this without retarding progress, the bulk of the followers needs to be able to keep near enough to the leaders to stay in the race.

Secondly, we want competition to afford customers an amply differentiated range of qualities and types of any given product to choose from. This is, of course, wanted for its own sake; but in terms of progress it means that the producers are exploring—and influencing—the customers' preferences and potential preferences, and products evolve in the directions these preferences indicate. Whether they evolve in the best directions is, of course, a different question. Product differentiation

[8] See, especially, Chamberlin, *Theory of Monopolistic Competition* (5th ed.), pp. 109, 171.

costs something, mainly because of the selling effort that is bound up with it. (For that matter, maintaining homogeneity of product costs something, too. And homogeneity of each brand is necessary for effective differentiation between brands.) The combination of selling costs with research and testing introduces an element of overhead cost which makes for large size and limited numbers of producers. But in a market as large as the American, this seldom goes to lengths that spell natural monopoly.

Thirdly, we want new products developed; and this is a necessary correlative of more efficient methods of production, if an increase of 2 per cent a year in productivity is to be absorbed without technological unemployment. New products, even if patented, are generally exposed to imitation and competition after a delay which is, by historical standards, not long.

A second group of objectives is concerned with the diffusion of the benefits of progress, to customers in lower prices or to those who contribute factors of production—chiefly workers—in higher real rewards. This involves a progressive sharing of the rewards of successful innovation, and the sharing becomes complete when the improvement has become part of the generally available state of the arts, from which special profits can no longer be made. This diffusion means that what Veblen called "the wisdom of the ancients" is not "cornered" by current business enterprise; only the recent advances made in it, and these only partially. The diffusion is wanted for its own sake, but it also has a special role in the incentives to progress. What it means is that a renewal of differential profits can be had only by renewed innovation. Thus it is part of the system that can keep incentives to continued innovation alive in full strength. This role would be vitiated if the diffusion were instantaneous and complete, since then innovation would bring no rewards to the innovator. The dynamic system is not one of elimination of profits, but one of erosion and re-creation, both of which are jointly essential.

For the economy as a whole, this process implies the creation, reduction, and re-creation of differential rewards in different industries, as well as for different firms. Professor Harberger's paper at the 1953 meeting developed a case for the thesis that existing differentials are relatively unimportant defects, by conventional utilitarian standards. This argument may not prove that we should be unconcerned about them; but it does strongly suggest that their dynamic impact is more important than their static. The goal is to subject them to active wearing down and prevent them from becoming so enduringly entrenched that they need not be earned and re-earned by progress.

The diffusion process also affects growth via the distribution of in-

comes, which in turn affects the market for the increased flow of goods, new and old, which progress makes available. This has two main dimensions: inequality between persons and between different industries or sectors of the economy. If one sector of the economy is progressive, it will be handicapped in realizing its potentialities if most of the other sectors are too poor to buy much of the products of the dynamic sector and too stagnant to increase their purchases as the productive power of the dynamic sector increases.[4] Development needs to be not too badly unbalanced; and from this standpoint well-diffused competition is favorable. Something similar is true of personal distribution, a fair approach to equality being favorable to the kind of demand on which mass production depends. On the other hand, new products have often been introduced first as luxury items, appealing to the rich or well to do, and later coming within the reach of mass demand, as increased sales and the resulting productive economies reinforced one another cumulatively. Nowadays, with the American mass market thoroughly established, it is sometimes possible to promote a new product for mass volume from the start.

What is not obvious about all this is the part played by competition. It opposes the inequalities of intrenched privilege; but if the labor market were thoroughly competitive, inequalities of wages based on unequal performance might be, by and large, greater than they are. On either basis, however, this country would have a great mass market plus a more limited luxury market, not too far above the mass market and shading into it by easy gradations. Competition also implies mobility of productive resouries, which is needed for adjusting to the inevitable inequalities in rates of growth in different parts of the economy. And in a growing economy, mobility is possible with a minimum of actual shifting of persons or capital.

A phase of this diffusion process is the creating of a market in which a customer may have considerable confidence that the offerings of different sellers are of approximately equal value and that he will not be seriously victimized if he fails to shop around, looking for the best offerings. This (limited) assurance is of real value to the customer who has many demands on his or her time; but it works only if enough customers do shop around. A competitive market tends toward one price to just the extent that customers watch for differentials and take advantage of them. This is the customers' essential role in a competitive system.

A third group of objectives is concerned, not with products and prices, but with the conditions of competitive rivalry in itself. It regards free-

[4] For the suggestion here adopted, I am indebted to R. Nurkse's *Problems of Capital Formation in Underdeveloped Countries* (1953).

dom and opportunity as ends in themselves. It is concerned with the human impact of competitive pressures on those who are exposed to them. But especially it is concerned that efficiency and the diffusion of its benefits should not be dependent on the good will and arbitrary decision of private producers, nor on direct governmental order, but on a situation in which normal business motives impel business units (acting independently) to conduct that will tend to further the desired results. This goal, like the goal of diffusion of gains, is overrigidified in the theoretical concept of an economic law which dictates economic conduct and its results with a precision from where there is no escape.

This would reduce economic freedom to a paradox, since the meaning of freedom resides in a margin of discretion in choosing one's course of action. One of the tasks of the kind of theory here contemplated is to define the margins of discretion that producers have and the margins they should have or can safely be allowed to have. They may, for example, face uncertainties and be governed by longer or shorter perspectives and broader or narrower conceptions of their interests. These all belong in a dynamic theory. The essential limits on private discretionary power are presumably satisified if the discretion of business units does not extend to doing things that obstruct the progress of the "generally available state of the arts" or prevent the public from getting the benefit of it. This is admittedly a not-too-precise standard; and may need some care to avoid tautology, centering in the phrase "generally available." It has a logical kinship with Marshall's "representative firm," and I believe it is not wholly meaningless.

Given these goals, how should one use them to judge a system? A general judgment may be influenced by appraisal of the performance of the system in the large. But for purposes of specific policy in actual cases, rates of progress and fairness of profits are too uncertain, dependent on too many irrelevant circumstances; and their use to determine legality would hardly be consistent with a free private economy. Instead, judgment must hinge on whether conditions are of a sort inherently adapted, by and large, to promote these ends. Three key tests may be suggested: free and independent action, incentive to do the kinds of things that are called for, and capacity to do them.

As to the first, it is not easy to make people compete if they do not want to; but collusion can be checked and protection can be afforded to the more competitively-minded mavericks who will exert pressure on the others. Dynamic change also tends, as we shall see, to keep rivalry alive. As to incentive, mention has been made of the carrot and the stick, of the joint importance of differential gains and their erosion, but no precise optimum rate of erosion appears to be definable. Where progress requires heavy research outlays, atomistic industries are handi-

capped as to both incentive and capacity: as to capacity for obvious reasons and as to incentive because the output of the single enterprise is so small that individual gains fail to measure the importance of the resulting progress for the industry as a whole. Thus in agriculture this element of progress depends heavily (though not exclusively) on governmental research and promotion.

IV. *Elements of Competition as Dynamic Process*

A theory of competition as dynamic process must be not a model but a framework within which many models may find their places, including equilibrium models as limiting hypothetical cases. As I have said elsewhere (*Monopoly and Competition and Their Regulation,* pages 326-328), the process includes initiatory action by a firm, responses by those with whom it deals, and responses to these responses by rival firms, to which one should add the subsequent rejoinders of the initiators, plus any actions that may be taken on a basis of anticipation. (For example, a rival may react defensively, before his customers have time to switch to a competitor.) The moves and the responses may affect productive processes, products, selling efforts or prices, or various combinations. They may be aggressive, defensive, or counteroffensive. Fully dynamic theory needs to conceive these patterns as themselves subject to change, over longer periods of time. Marshall's life history of a firm may be matched by life histories of products or product variants, and of the marketing patterns connected with them. Stages of exploratory introduction, aggressive expansion, defense of established position, and decline—all have different features.

For dynamic theory, a key element is a time interval between moves and responses, or a time distribution of responses; and this time factor is typically essential to give firms an incentive to make competitive moves, by giving them a chance for a temporary gain before their moves are neutralized by the defensive or counteroffensive responses of rivals.[5] Or there may be other elements tending to prevent immediate and complete neutralization.

Perhaps the chief common feature of competitive action is an expectation of a gain that is sure to be eroded; and it is not convincing to make competition hinge on businessmen being so uniformly stupid that they experience this repeatedly without learning to anticipate it. At least the more intelligent must be thinking in terms of a result that will outlast the erosion process: and in this light the decisive motive must be a preference for eroded profit on a larger volume of business,

[5] After writing the above, I find these time elements recognized by A. Henderson: "The Theory of Duopoly," *Quart. Jour. Econ.*, November, 1954, pp. 565, 580. Also by the Civil Aeronautics Board, according to a report of its decision in Air Freight Tariff Agreement case, 14 C.A.B., 424, 428, 430 (1951).

over a similarly eroded profit on a smaller volume. I speak of an "eroded" profit rather than "zero profit," partly because before profit from one successful move is reduced to zero, other moves may have brought other profits, and partly because "zero profit" carries a misleading precision. It is interesting that Chamberlin's tangency theorem for differentiated products involves conduct of the opposite sort: pricing for short-term profit, which after erosion leaves the producer with a smaller volume than he might have had with a more farsighted policy. This can happen; but the diagrammatic proof that it must happen wherever product is differentiated, is unconvincing once one makes adjustments in the concepts of cost and cost curves and demand curves which are needed for dynamic theory.

Cost, conceived as including the minimum return necessary to attract capital and enterprise, includes, under dynamic conditions, large elements of unpredictable obsolescence, thus making zero profit an indefinite, but substantial, quantity. This makes it rational to prefer larger to smaller volume, at zero profit; and this seems clearly to accord with the characteristic American business emphasis on the importance of growth.

As for the envelope cost curve, so frequently used, each point on it must logically represent the most economical method of producing a given output, if a plant could be adapted to that output and never have to change. It takes no account of fluctuations or of growth by substantial-sized units or of provision of reserve capacity to be ready to handle contingent increases, including those which a vigorous sales-promotion campaign might bring, if it proved successful. No competitor likes to expose himself to losing customers to his rivals because he cannot fill their orders promptly enough. Thus on a more realistic curve of cost with scale or size of plant or enterprise, each point would represent, for a given size or expected average output, the average cost that might be expected during the period in which the plant or enterprise remains of this size, allowing for periods when it will be working at part capacity and relatively high average cost and other possible times when it may be working overtime or otherwise be pushed beyond its optimum rate. Such a point would not be on the short-run cost curve but above it, and a long-run cost curve connecting such points would intersect the short-run cost curve, not be tangent to it.

The real point is that the whole range of actual or probable movement on the short-run curve comes into play, not merely the point of supposed tangency. At that point, long-run and short-run marginal cost are equal as drawn, thus obscuring the fact, which is crucial for explaining actual competitive behavior, that at most times short-run marginal cost is quite substantially below long-run marginal cost (which in turn is

likely to differ little from average cost) while occasional peaks of demand may push short-run marginal cost well above both long-run marginal cost and average cost. A firm may price well above marginal cost—pricing for maximum profit as determined by a sloping individual demand curve—and may still fail to cover average cost.

A timeless two-dimensional demand curve of the conventional sort leaves out of account the fact that the effect of a given price, or price differential, on the volume of sales is a function, among other things, of the length of time during which it has been in effect. The effect may reach its limit in time, or may be indefinitely progressive, if the stimulus can be maintained. This time dimension has been recognized at times by economists—generally when they were not speaking as theorists. It means, among other things, that the effect of a given price on sales volume depends on the previous price or price situation; and that the curve is not fully reversible.

A given price may take full effect in minutes (as on a produce exchange) or may take decades where it requires changes in consumers' ways of life which have strong inertia. An example might be the effect of reduced electric rates in stimulating household appliance use of electricity. This case is typical in that the active variable is better described as a price policy than a price, and acts jointly with promotion of the sale of household equipment. Similar comments apply to alterations of the product and moves in the area of sales promotion. This complex of variables would overload any possible system of graphic presentation. A family of three-dimensional surfaces—the third dimension being time—with a different surface for each initial price or price situation, would still be a simplification.

Both for cost curves and demand curves, movements along the long-run curve involve a shifting of the short-run curve, setting up a new one of different dimensions from the former one. In the diagrammatic development of Chamberlin's tangency theorem, the treatment of cost and of demand in this respect is nonsymmetrical. Long-run movements of demand are treated exclusively as unanticipated shifts of the short-run demand curve, and producers are assumed to be governed exclusively by the short-run curve prevailing at the moment and not by longer run expectations. Thus his diagrams utilize a short-run demand curve, placed against a long-run cost curve. A different method could lead to significantly different results.

The responses of those with whom a competitor deals bring in an economic process which is naturally left offstage by equilibrium theory but is essential to dynamics; namely, market canvassing and bargaining. Galbraith has taken advantage of theory's neglect of this process to annex it as one sector of his rather heterogeneous category of counter-

vailing power, treating it as a substitute for competition which has lapsed into passivity. Actually, as theory should have been insisting all along, this activity of customers is a necessary complementary part of the process of competition, serving to bring to bear and make effective the competitive alternatives that may exist. Without it, competition would become passive, though, as earlier noted, many customers can neglect it without serious results if enough others attend to it.

Three grades of customer activity may be distingushed. First, buyers may simply canvass the available alternatives and choose the one they prefer. This increases the cross-elasticity of demand on which the effectiveness of competition depends and tends toward equalizing the attractiveness of different sellers' offerings. Second, some buyers may try to get a better bargain than is currently offered, using their power to shift their patronage as a leverage. It is chiefly the larger buyers who have a chance to do this, and it is likely to result in discriminatory favors, granted frequently (but not exclusively) by the smaller and less powerful suppliers. Letting contracts on a basis of sealed bids is one variant of this process in which one large buyer tries to bring to bear a specially active form of competition for his individual business out of which he hopes to get a differential price. Finally, there is the buyer with real monopolistic power, or bilateral monopoly, in which it seems that almost anything might happen.

V. *Some Applications*

The foregoing ideas suggest, among other things, some modifications in current theorems, including those of pure oligopoly, and the tangency theorem for competition with differentiated products and sloping individual demand curves, tending to reduce the departures of these models from older conceptions of cost-price equilibrium. In the case of pure oligopoly, the indicated modifications begin with the question: Under what conditions is it natural for a firm to expect an increase or decrease in its price to be followed or not followed by its rivals, and how may these expectations be modified by devices available to a firm, other than a simple increase or decrease in its list prices? The suggestion has been made that an increase is more likely to be followed if costs have risen generally. And this possibility can be sounded out by announcing in advance an intended increase, which can be withdrawn if rivals do not follow suit. If there is much unused capacity, a price advance is unlikely to be followed, and existing prices are likely to be subject to downward nibbling. But if prices get ruinously low, a move back toward a more normal level may be followed, though likely to be unstable.

The number of rivals plays a part in that, if unused capacity exists, the actions of the group tend to be controlled by that member whose ideas lead to the lowest price policy. Numbers also play a part in that

the initiator of a price reduction which is not instantly neutralized can stand to gain more than any one of his rivals stands to lose. Thus the outcome may be affected by differences between the slopes of what may be called the aggressive and the defensive demand curves, as well as by differences between the curves envisaged by different firms. More important, perhaps, are devices for making concessions which will not apply to a firm's whole business but mainly—at least for a time—to the added business it hopes to gain. When demand is strong enough to utilize capacity fully, prices would tend to rise under either oligopoly or old-fashioned competition; but the rise under oligopoly may be more moderate because influenced by a longer time perspective. Another mitigating factor is the existence of stand-by capacity, of only moderately inferior efficiency.

As to the case of differentiated products, if this is treated in terms of short-run cost curves, price may be above short-run marginal cost and still be below average cost, and below long-run marginal cost. A fairly typical hypothesis would be that the bulk of production is on a scale sufficient to afford the bulk of the economies of size, implying that the slope of the long-run cost curve is sufficiently flat and uncertain to be an unimportant factor, except for definitely small firms. I cannot conceive a firm deliberately following a price policy which, for the sake of a small price advantage, would condemn it to be one of these small firms when a more aggressively competitive policy might lead to progressive expansion. Such a size-limiting policy involves outright danger to survival, not merely larger or smaller profits.

While competition may emphasize model changes and sales promotion, these in themselves tend to create uncertainty whether a price reduction will be fully and instantly met. Thus they tend to prevent price differentials from becoming so settled in trade custom that a price reduction by one firm is sure to be instantly neutralized by the others. Thus, while competition spurs innovation, innovation in turn helps to keep price competition from settling into an inactive rut.

In both types of case, needless to say, a workably competitive result requires that there be no outright collusion. But it does not necessarily require the ignoring of rivals' probable reactions; merely that their expected reactions should not be so prompt and complete as to wipe out all competitive incentive, either hope of gain or fear of loss from letting others "get the jump." This latter may be the more important factor.

VI. *The Over-all Picture*

The foregoing is a mere fragment of the whole picture. It by no means implies that all industry is satisfactorily competitive. It leaves much room for inequalities in the impact of competitive pressures in different

parts of the economy. The most serious inequalities are those between the pressures of competition in industry and trade, on the one hand, and, on the other hand, the pressures it would produce, if unmitigated, on agriculture and labor. One explanation for this inequality seems to carry the implication that competition in these fields would impose no undue burdens if only industry and trade were not shot through with monopoly, raising the prices of the things workers and farmers buy. Without denying that there is a measure of truth in this, I venture to suggest a different hypothesis as more important; namely, that in industry and trade, the producers' side of the market adjustment is dominated by entrepreneurs' dollar expenses, which will (with qualifications) veto production if receipts do not cover them, while in the case of labor and one-family farming units, the producers' side is a genuine supply schedule which is highly inelastic and may be actually backward-sloping—meaning that a reduction of wages or farm prices tends to result, if anything, in more crops raised, or hours of work offered, rather than less.

This is, of course, not a new idea, but it seems to carry a two-sided consequence. One side is that labor and agriculture might need some mitigation of the pressures of competition, even if the rest of the economy were unqualifiedly competitive. In other words, if we got rid of all monopoly in industry and trade, that might still not make the economy safe for unmitigated competition in labor and agriculture. The other side is that an acknowledged need on the part of labor and agriculture for mitigations of competitive pressures is neither proof nor measure of the dominance of stultifying monopoly in the rest of the economy.

There can be no certainty that competition will remain vigorous in American business. The necessary conditions are a fascinating subject for speculation. Tentatively, they appear to include three mutually interacting areas: public policy expressed in the antitrust laws, the aggressive psychology and adaptability of the American businessman, and the impact of continuous change in techniques, products, and channels of trade, tending to keep things stirred up and uncertain and to prevent competition from lapsing into routine passivity. In the troubled years that lie ahead, this complex of factors is destined at best to an insecure existence. To keep competition healthy requires the traditional eternal vigilance. To recognize competition when we see it, in its present-day forms, requires not only factual study but some reorienting of the traditional framework of theoretical concepts in which the facts may find their interpretation.

REVISED DOCTRINES OF COMPETITION[1]

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I

Modern doctrines of market competition have now reached legal majority since their birth for public display in 1933. Like many an anxious parent bewitched by the enigma of whether their offspring are prepared for life, both Mrs. Robinson and Professor Chamberlin have recently been analyzing their intellectual progeny, betraying particular concern with the frailties of their creations. Mr. R. F. Harrod, too, with some priorities in this intellectual genealogy, has been lamenting some antics of his slightly later-born, lucid and renowned "Doctrines of Imperfect Competition";[2] an air of urgency covers the transformation that he desires to impart to his fondling.

Let us consider the recent parental diagnoses and precepts, some of which will arouse neighborly head-shaking. Later, brief attention will be paid to a few rebellious playmates of their prodigies.

II

I deal with Mr. Harrod's beliefs first and at greater length, for I surmise that from a doctrinal standpoint the issues raised are paramount. Necessarily, it is the total impact of the argument, omitting qualifications, that is sought.

Harrod proposes, first, to discard the doctrine of excess capacity, largely deduced from the tangency acrobatics, as incompatible with his new attitude on price formation. Thence he argues that it is increasing returns and not imperfect competition which is the causal culprit pushing output from the social optimum. All points devolve from the revised theory of price determination, with the first being an implication of it while the belaboring of increasing returns constitutes a revived scent in the old hunt for *the* social devil.

Driving up to his price doctrines, Harrod denounces as "altogether wrong" the "generally accepted" opinions on the alleged excess capacity defections of imperfect competition as being based on faulty and contradictory hypotheses of entry and short-period profit maximization. He assures us that "any experienced man of business would pronounce it most 'unsound' to make a temporary surplus profit by charging a

[1] I should like to thank Dr. Almarin Phillips, of the University of Pennsylvania, for several useful observations.

[2] *Quart. Jour. Econ.*, May, 1934. Reprinted as "The Theory of Imperfect Competition Revised," in his collection of *Economic Essays* (Harcourt, Brace, 1952). All quotations below are drawn from this source.

high price at which it is known that sales are unlikely to be . . . maintained in the long run. It is surely wrong for economists to insist . . . that this is none the less what entrepreneurs normally do" (page 147). If competition increases, he avers, all investment is "too large." So right from the start the price is designed to fend off potential competition.

Criticising the tradition further he asserts: "The radical mistake is in assuming that as soon as he has his plant he [the entrepreneur] forgets about long-period marginal revenue."[3] But "long-period considerations on the demand side remain just as relevant to day-to-day pricing policy, after the plant has been constructed as it was before" (page 150). Hence, with "free or relatively free entry, the entrepreneur . . . will plan to charge a price yielding only a normal profit" (page 151)—defined as a sum which the entrepreneur would "deem just sufficient" when contemplating a plant extension.

This provides ample clue to Harrod's conception of the pricing process. Unmitigated pecuniary myopia and malevolence are supplanted by secular prudence and beneficence. Fair long-run price exactions expel maximum short-run extortions in this quick overturn of dogma. Mr. Hyde is Dr. Jekyll again and we are expected to lie in comfortable repose with him. Once implored to defer to the view that firms always respired in short-run exhilaration,[4] we are now beseeched to accede that they are never wholly elated, but instead are pensively aglow in contemplating a long-run thrill to cap their short-run frustration.

All this stems from his doubts, pursuant to the well-known Oxford price queries, whether entrepreneurs "act under the pure motive of profit maximization" (page 139). Yet the entrepreneurs of his image behave in precisely this way, given only a longer price horizon. Plant layout, output, and price are of an order to entail the tangency of the long-period demand and cost curves. But the "equilibrium does not entail the presence of excess capacity. The old doctrine was partial and . . . incorrect, because it considered pricing policy in isolation from investment policy. The new doctrine rests on an integrated theory of investment and pricing policy" (page 162).

Readers who have followed the "full cost" controversy in the *Economic Journal* will be aware of the kinship of Harrod's ideas to those of Mr. Andrews.[5] Interestingly, Harrod contends that marginal and full-

[3] Rightly, and long overdue, he points out (p. 149) that the planning curve yields an erroneous solution if demand changes. Yet this is only part of the case against this technique. See my "Limitations of Planning Curves," *So. Econ. Jour.*, October, 1950.

[4] See Harrod's *Trade Cycle* (Oxford, 1936), pp. 75-76, where he declares that "entrepreneurs arrange matters in the short period, so far as they can, to make marginal revenue equal to marginal cost." Although a qualification is made for user cost, the over-all impression is that of short-run maximization.

[5] See the review article by E. A. G. Robinson, "The Pricing of Manufactured Products," *Econ. Jour.*, December, 1950, and discussion, M. J. Farrell, A. Silberston, and E. A. G. Robinson, *ibid.*, June, 1951.

cost analyses can be joined, with the latter providing the entrepreneurs with "a shorter and manageable way of reaching the same result as he would if he could assess these elusive [marginal] quantities." Compatibility, however, is "subject to the proviso that the entrepreneur dare not charge a price above full cost without rendering his market vulnerable . . . " (pages 161-162).

An integrated theory of investment and pricing, as well as the marriage of the contesting price theories, would, if consummated, merit applause. Yet the ideas promulgated sometimes appear deficient and incomplete. Under the space limitations operative, arguments will have to be brief.

First, there is one form of the theory of long-run maximization that is wholly barren and tautological. At least the theory that firms maximized short-run pecuniary profits was in principle operationally testable. But to declare that firms maximize long-run profits could preclude verification, for in a dynamic setting this fact could only be solidly established on a retrospective probe; even then, if the firm succeeded in blocking competitor entrants, it would be fuzzy without information on the profits that would evolve with entry and adherence to a short-run maximization policy. Only an omniscient mind could test this hypothesis. Of course, it may be alleged that businessmen seek to maximize their long-run profits, not that they succeed. This is a very different theory indeed. Inevitably, questions arise concerning the demand-cost appraisals and deliberative powers of the entrepreneur. Manifestly, the rationality, or even the intuitive judgment, required to validate the long-run hypothesis, considering the greater intricacy of the calculations, requires a higher order of acumen than necessary for shorter period maximization. Ironically, full cost doctrines were proffered in part as a simplification, on the grounds that marginal calculations were too complex for the businessman. Now he is required not only to know the present state of the market and costs, but also the future state of each, and the intentions of other firms as well. Mr. Farrell even has him performing matrix algebra on the argument that "our mathematics provides a fairly close analogue to the sort of reasoning that Andrews describes the businessman as performing." (See his "An Application of Activity Analysis to the Theory of the Firm," *Econometrica*, July, 1954, page 297.)

It does not help to ask the businessman whether his price policy is believed to pay best dividends over time. Presumably he thinks so; otherwise an alternative would be embraced. But this is hardly a theory of long-run maximization in any objective sense. It barely transcends the platitude that whatever he thinks is right, he does. It can, of course, be contended that only a subjective, nonmeasurable—even objectively erroneous—theory of price behavior can explain market conduct. But

it becomes a perverse argument when erected to dismantle the concept of excess capacity, for propositions on the latter phenomenon possess, or should have, an objective flavor.

Harrod's argument, in its pricing dimensions, is not so weak operationally—though the implicit diagrammatic appeals often convey a misleading objectivism—for his entrepreneurs calculate price in terms of unit costs at "normal" operations, with profits included. But the very reference to normalcy, together with the "sufficient" profit allotment, and the acknowledgement of the "jiggery-pokery in the fixing of prices" (page 163), disclose the subjective bias in the pricing technique. Equally normal individuals charged with identical responsibilities need hardly emerge with parallel price results. Curiously, after recognizing multiple-product firms, Harrod argues that the firm's own cost calculations describe what other firms will experience in undertaking the same output. This could be so only within some zone of tolerance and hence provides little reason for firms to price merely to cover costs.

Emphasis on the subjective aspects of the pricing process should in any event finally dispel mechanistic ideas based upon fully discernible objective demand and cost criteria. (Current welfare economics often seems to be based on the faulty premise that these are fully objective functions.) Prices ultimately come to be a resultant of the urges and restraints, the moods of caution and abandon, even the neuroticism of entrepreneurs. Efforts to polish it up and purvey it as a piece of objectivity or business rationality and moderation in other than perfect competition and stationary circumstances are illusive—maybe only occasionally true.

On his own terrain, open in all Harrod's discussion is the exact content of the long-run demand curve, or precisely what operational or clock span it serves to cover. (He declares, on page 151, that the long-run demand curve "has greater elasticity than the short-period curve" and consequently the long-period marginal revenue curve "will cut all the cost curves at points farther to the right" than the short-period curve. If Harrod means that the full-demand curve is more elastic at each point, there may be some error unless he visualizes perfectly elastic long-run curves. What he seems to have in mind is the slope rather than the elasticity.) Reference to Marshall does not immobilize criticism, for even in his work the concept is not particularly illuminating. What seems to be fundamental for Harrod is the time projection before competitors will react, not the time length before capital installations can be modified. If entry is suspected as in the immediate offing anyway, perhaps from an existing multiple-product firm and with a presumedly durable market demand division thereafter,

the theoretical pitch may be described as "long-run," but the effective theory of maximization either in operational or clock-moves would belong to the short-run. Cases where potential competitors among existing multiple-product firms express a willingness to produce a substitute product without actually receiving orders belong to the same family of illustrations; there is in these cases no immanent reason for prescribing a long-run expository format.

Failure to work in terms of overt clock intervals constitutes a major shortcoming of Harrod's analysis. Much of the burden of his argument relies on the hypothesis of complementarity between today's price and future demand, with lower prices today lending buoyancy to subsequent demand. Effective resolution of the pricing problem under this hypothesis requires a disclosure of just when "tomorrow" falls in view of discounting, as well as the exact magnitude of the demand complementarity. In neither respect is Harrod enlightening.[6] Some skeptics might even aver some inconsistency in that Harrod utilizes the Oxford studies to buttress the view that price-wise entrepreneurs adopt a "long view," whereas similar studies revealed that their investment purview was remarkably short, for equipment often under five years.[7] A long-run price theory might then be reasonably short clock-wise, suggesting mainly that price is not altered daily or even monthly. Concretely, there may be other good reasons to refute the assigning of any real temporal depth to the long run. For example, if an imminent depression is foreshadowed, with operations unprofitable anyway, it is obviously wiser to make immediate hay. It would be an act of temerity to counsel an entrepreneur to look far ahead. This is not without bearing if we are destined to live in an era of high employment compounded with prospects of depression. Furthermore, so much of Harrod's analysis seems to pertain to a new firm in the drafting-board stage making an initial pricing decision. Yet a child of innovation may well expect the dynamics to continue and not adopt a distant pricing vista.

Finally, Harrod's normalcy pricing criteria are predicated on the efficacy of entry for curbing price and profit distortions. Over a wide area this hypothesis is simply inconsonant with the facts. In the largest of our corporate entities, this may be among the lesser reasons governing price policy. Conversely, granted ease of entry, as in retail trade

[6] Farrell's treatment (*Econometrica*, 1954) is in this respect more helpful. J. R. Hicks, recognizing much the same point, moves to repair the dyke in "The Process of Imperfect Competition," *Oxford Econ. Papers*, February, 1954. It should be noted that Harrod is smitten by the temporal-complementarity case. Yet where quality is judged by price, lowering price toward "full cost" may reduce future demand. See T. Scitovsky, "Ignorance as a Source of Oligopoly Power," AEA *Papers and Proceedings*, May, 1950.

[7] See H. D. Henderson, "The Significance of the Rate of Interest," *Oxford Studies in the Price Mechanism* (Oxford, 1951), pp. 19-20 Also, George Terborgh, *Dynamic Equipment Policy* (McGraw-Hill, 1949), Chap. XII.

where nonpecuniary motives may dominate or in circumstances where large firms are bent on securing a foothold for alternate products, it is an act of valor for the firm to release the trapped profit-bird for the elusive profit-promise.

The theory obtains its best chance for survival in those intermediate cases where entrants are neither doomed nor undeterred. And here, as argued, its heuristic value is doubtful. We are entitled to more illumination on the temporal dimensions of the analysis, on the concept of "normal" operations and its revisions, on the compatibility of subjective and objective demand and cost phenomena,[8] and of the influence of product and technological innovation on price policy. While his fascination is with the "polypoly-entry" case, customary market categories omitted are pure and nonprice competition—though he declares his argument pertinent to the latter (page 159)—oligopoly, bilateral monoply, as well as monopsony and price discrimination structures.[9] Selling outlays, which do belong in a cost-oriented theory, are barely referred to, as if to uphold the laconic tradition of imperfect competition theories. The omissions serve further to narrow the area of materiality of the theory.

In his final point, on the causes of the divergence of actual prices from optimal norms, Harrod concludes that the mischief comes from increasing returns, which makes imperfect competition inevitable. Conversely, without increasing returns there is actual or potential entry and long-period price equilibrium. And: "I further hold that, with constant returns . . . output will normally attain the social optimum" (page 179).

Leaving aside questions concerning the optimum, the argument appears forced. Whether a firm operates in conditions of increasing returns is partly a result of the number of substitute products that rise to sate the diversity of tastes. For goods catering to a large audience, enforced standardization and rationalization might render decreasing costs less likely. But it is the very diversity of tastes which provides opportunities for new entrants, and it is this—the entry—which causes increasing returns rather than, as Harrod sees it, increasing returns

[8] This problem is generally ignored by those who emphasize the subjective nature of demand and cost constructs. I tried some time ago to analyze the problem but there seems to be a vast disinterest amongst price theorists in this question. Cf. my *Price Theory* (Pitman, 1949), Chap. 16.

[9] There is a tantalizing minor paradox here in that Harrod's emphasis on entry presumes an oligopoly aspect while his analysis of the pricing policy is premised on polypoly. Though logically impeccable, it seems more likely that where a firm fears new entrants, it already has close competitors, so that price making does partake an oligopoly character. Cf. M. E. Paul, "Notes on Excess Capacity," *Oxford Econ. Papers*, February, 1954, p. 39. Also Hicks, *op. cit.*, p. 49. Harrod's neglect of the oligopoly problem is noteworthy considering his flirtation with a Cournot solution as early as 1934. See his "Equilibrium of Duopoly," *Essays*.

being instrumental in preventing entry. This is a standard Chamberlin position and it lends credence to his protest that he has been misunderstood by his British friends. (See *The Theory of Monopolistic Competition* [6th ed.; Harvard, 1948], pages 108-109.) Once producers do become numerous, each closeted with a different clientele, then the refrain of too many firms, too many entrepreneurs, each producing too small an output—and thus excess capacity—becomes faintly audible, gaining in volume when the firms are detected operating at outputs below minimum average cost. It follows that the doctrines of excess capacity may hang on, not greatly shaken, much less shattered. In the illustrative form of nonprice competition in which Chamberlin presented it, surely Harrod has failed to dethrone it. (*Ibid.*, pages 193-194.)

Whether with constant returns output will be optimal seems to me doubtful. Apparently Chamberlin's arguments are, in this context, being rejected or ignored. As I accept them, I need only refer to his position. (*Ibid.*, pages 196-199.) Of course, much hinges on the interpretation of "normally" and "optimum." An equilibrium with sales outlays, fewness, nonprice competition, patent grants, and deceptive product variations seems remote from the welfare economist's ideal.

III

In a mood of self-deprecation and recantation, Mrs. Robinson prefaces her article by declaring that her significant volume, which endowed us with much of our market insight and analytical technique, "was a scholastic book" and not "a suitable basis for an analysis of the problems . . . which present themselves in reality" (page 579). Various aspects of the theory of market structures then pass before her pen as she expresses her current attitude.[10] The treatment can be brief, for her work is generally prescriptive and the discussion not exhaustive.

Some opening definitional remarks on industries and markets may be puristically unacceptable. The former is envisioned as consisting of "firms . . . alike in their methods of manufacture," for this "represents the area within which a firm finds it relatively easy to grow," while markets are comprised of "the demand for . . . commodities which are close substitutes" (pages 579-580)—essentially a "group" concept. Then Mrs. Robinson is moved to recommend that we recognize the prominence of the multiple-product firm and the importance of the theory of price discrimination, for while "dropping the fiction of one-commodity firms destroys the simplicity of the analysis of imperfect

[10] Quotations are from her "Imperfect Competition Revisited," *Econ. Jour.*, September, 1953.

competition," it simultaneously "enlarges its scope" (page 580). These are, I think, reforms long overdue to bring our theory closer to industrial facts. They need not render the presentation more abstruse in every case, for the analysis of single-product firms can be retained and applied to multiple-product firms whose outputs are independent on the cost side.

In some blithe paragraphs on "Who Maximises What," Mrs. Robinson sides with the retention of the entrepreneur concept, not as a concrete image but as a personification of a firm in its policy-making aspects. Opinions are likely to differ on descriptive details rather than upon the expository need for the construct.

It was Mrs. Robinson who originally made us face up to what she then called the "fundamental assumption," to be caricatured by some,[11] as pecuniary profit maximization. Appraising the aims of the firm anew, she argues that these are, first, to survive and, secondly, to grow. Both objectives invite a long-run maximization hypothesis. Critics are chided to produce a better premise. On the size of firms, she opines that there is no unique optimal size; some interest, however, attaches to her descriptive comments on growth. Confessing to having been baffled by the oligopoly problem originally, her present paper is disappointing in its failure to devote to it more than the few lines acknowledging her earlier bewilderment.

Reflections on the forms of market competition carry her into the Chamberlin camp, declaring that "the assumption that price is the main vehicle for competition is a great over-simplification of reality" (page 584). She lists the usual types of competitive maneuvers, including differentiation, sales promotion and advertising, price, as well as the legerdermain of raising price to impart a quality aura or snob appeal to a good. All this, detail aside, is already modern doctrine mainly due to the efforts of Professor Chamberlin.

Observing that profit-maximizing calculations are unlifelike, in the most significant section of all, on "Price Policy," Mrs. Robinson argues that in a continuing economy prices are only altered when the reasons are obvious. Her reappraisal of the "marginal revenue equals marginal cost" rule encompasses the following cases: (1) A new product or line for an existing firm: the conception is deemed overformal rather than misleading. (2) A multiple-product firm producing both competitive and noncompetitive products: she concludes that the assumption does not fare too badly. (3) A change in costs: under price leadership and oligopoly the maximization analysis is ineffectual. (4) New products: price policy, she argues, will be contingent upon costs to potential

[11] See T. W. Hutchison, *The Significance and Basic Postulates of Economic Theory* (London, 1938), Chap. IV.

rivals; she refers to Harrod's argument as pertinent. (5) Cyclical fluctuations in demand: competitive and oligopoly prices are distinguished where the latter leads to priorities in lieu of price rises on the upswing, while "full cost" and "spoiling the market" conceptions interfere with adjustments on the downside. Concluding, in a passage to which many of us will subscribe, she remarks that "it seems clearly impossible to replace the old text-book slogans with any simple generalizations. A debate which consists in defending or attacking 'principles,' such as the 'full-cost principle,' the 'marginal principle' or the 'normal cost principle' and trying to fit all types of situations into one system is obviously foredoomed to futility" (page 590).

On the concept of equilibrium, Mrs. Robinson arraigns much of contemporary work, in a manner reminiscent of Marshall, with the plaint that "in my opinion, the greatest weakness of *The Economics of Imperfect Competition* is one which it shares with the class of economic theory to which it belongs—the failure to deal with time" (page 590). Unfortunately she does not move the discussion very far, though she infers that a simple Marshallian hypothesis will not serve, for "there is no such thing as a position of long-run equilibrium which exists independently of the course which the economy is following at a particular date." Irreversibility is pronounced as the rule, for past decisions affect the content of the future equilibrium. This should not have required saying, except that Marshallian long runs appear sometimes to be divorced from the (recent) adaptative path. Mrs. Robinson declares pointedly that "the very notion of long-run supply curve, in its usual simple two-dimensional form, ceases to be admissible" (page 591).

In closing, Mrs. Robinson inquires into the causes of monopoly and declares that "the chief cause . . . is obviously competition," with the vigorous firms absorbing the weaker ones. "Vigorous" remains to be defined, for strength possesses several facets. As a twist on the Galbraith theme, she also renders the judgment that monopoly at one stage of nonintegrated output fosters competition at other stages. "The second main cause of monopoly"—enforcing discipline and loyalty to a price leader—is a "severe decline in demand." And "it is much easier to think of causes for monopoly and examples of monopolies being formed, than it is to think of causes or examples of monopolies breaking down" (page 593). Mrs. Robinson pursues the theme that there are only "narrow areas in the economy where conditions are such that competition can normally prevail" in "The Impossibility of Competition," in *Monopoly and Competition and Their Regulation* (Macmillan & Company, Ltd., 1954), E. H. Chamberlin, editor. Schumpeter's "creative destruction" by new monopolies replacing old ones

and Galbraith's countervailing power seem by accident or design to have eluded her. Her conjecture, however, does deserve more critical attention with empirical investigations providing the clues.

IV

Through Professor Chamberlin's reconsideration runs the strong faith that he has given his intellectual offspring a good constitution, though some mistakes in training are acknowledged. (See "Monopolistic Competition Revisited," *Economica*, November, 1951.)

The vital economic organ—"our economic atom"—is proclaimed to be the firm, with U-shaped cost vertebrae in both the short and the long run. The dissolution of pure competition is attributed to both economies of scale and diversities in tastes which "result in one producer for each product, with often a complicated set of oligopolistic relations between them. This is a far cry from pure competition . . ." (page 349).

Whereas by tradition entry is extolled as in the public interest, Chamberlin writes that this matter "urgently requires comment." Citing patents, trade-marks, colonial trading privileges, and public utilities, he deduces that "from these examples . . . it is not a self-evident principle of public policy to eliminate all such impediments to entry. Indeed they could not be completely eliminated, any more than all men could be made equal in ability or merit by legislation" (page 351). Whetting our appetite, Chamberlin omits a supporting elaborative sustenance.

On his own views, he undertakes to remove "two misinterpretations"; to wit, that " 'tangency' has been associated *only* with the 'group problem' " and the belief that the isolated monopolist "has been held strictly apart from the theory" (page 353). Both views, he alleges, are mistaken. The first error, surely, should never have been committed: a public utility may find profits barely possible only at one rate structure and output: certainly new entry need not be an indispensable prerequisite for the zero-profit result. Likewise the isolated monopolist, interpreted as a firm whose cross-elasticities of demand vis-à-vis other individual firms is small, obviously fits into his analytic scheme though the problems engendered are rather tame compared to the circular structures.

Chamberlin then develops a point on which, in my view, confusion is even more rife, judging from the textbook tradition and teaching practice. He assigns the sloping demand curve for the firm's product to the diversity of tastes. Thereupon, he finds nothing "ideal" about the minimum AC point and its associated output. In his words: "Such a programme [of enlarging output in each firm in order to minimize

average costs] . . . indicates nothing so much as a complete misunderstanding of the problem" (page 354). Manifestly, if the demand for the firm's product cuts AC to the left of its minimum, it would be pointless to compel the production of the minimum AC volume of output. Yet it is not uncommon to find this output level labeled "optimal," as if the concept has meaning isolated from a demand context.

In a more conscious time framework, more might be said on this point. For example, suppose that in the given time interval the maximum profit output was precisely one-half that of the minimum AC output—a hypothesis not too far-fetched to judge by some diagrammatics. If the AC disparity exceeded carrying costs on the stock, it would seem to be prudent for the entrepreneur to produce the larger quantity, doling out in sales (approximately) the monopoly-maximum output in each time period. In the interim—the "idle period"—the firm could devote its facilities to some alternate outputs. Real problems and solutions of this sort are concealed in a stationary framework but become obvious in a time-dress analysis.

Having originally placed the oligopoly problem before us, Chamberlin suggests that "the subject needs to be rewritten in terms of . . . cross-elasticity of demand, rather than in terms of the number of sellers in a market" (page 355).[12] This is likely to be merely definitional, elucidating criteria for the recognition of the problem rather than providing a guide for its resolution. There follows a salutory statement that insofar as a problem signifies "indeterminateness . . . it is certainly the job of the economist as a scientist to say so" (page 355). Some economists have persuaded themselves to the higher virtue of ignoring these situations for the very same reasons, using models of pure competition as their analytic guide. It is not by accident that their policy recommendations often lack relevance.

Discussing cases in which entry into an oligopoly sphere multiplies the number of firms and products and raises unit costs and prices, Chamberlin concludes that this upshot appears to represent "genuine waste" (page 356). More might be said here. Situations can be conjured in which this may occur and yet the product diversity cannot be so simply interpreted. Consider a new product which weans away so many customers from the old products as to drive up their prices. From the paucity of information and the enigmas of interpersonal

[12] In a more recent comment on R. L. Bishop's use of the measure, Chamberlin writes that "Bishop's major contribution . . . is a convincing demonstration of the complexity, even the treachery, of cross-elasticity as a measure of anything." (*Am. Econ. Rev.*, December, 1953, p. 911.) This puts a new complexion on the earlier remarks. Thus: "I . . . hold that the individual seller is isolated under . . . differentiated competition; also under pure competition; and that the essential distinctions are between heterogeneity and homogeneity, isolation and nonisolation" (p. 913).

comparisons, I do not think that we are entitled to conclude that well-being has suffered.

Infringing upon Schumpeter's trade-mark, Chamberlin states that between them "with respect to the role of monopoly in the process of economic development there is agreement." Monopoly stimulates innovation and then the dilemma: to prevent the monopolist from becoming "fat and lazy," there is required "both monopoly and competition . . ."—presumably of the monopolistic variety. This problem, too, I think can only be handled on a dating approach with the life of fixed equipment and the rapidity of technological change constituting the crucial elements.

In summarizing, Chamberlin explains that concepts involving numbers—almost the very language of product differentiation—are to be dropped from the technical vocabulary, to be replaced presumably by a proliferation of cross-elasticities. These austere gestures represent concessions—since withdrawn?—to precision and purity. As they strike a blow at concreteness, my guess is that in verbal accounts they will enjoy a hardy life. There is, too, the remark on entry, that "the problem . . . disappears along with the group, and becomes absorbed into the larger problem of the distribution of resources throughout the entire economic system" (page 362). As it stands, this is obscure and mystifying. Undoubtedly the relations are tangled, as are all general equilibrium matters. Yet there are some peculiar problems of new firms and resource organization under uncertainty which form part of the theory of entry but are not normally treated with the general theory of resource allocation. I see no easy way of excommunicating the theory of entry from particular equilibrium analysis. Perhaps Chamberlin will elaborate his ideas. In the same way it is an exaggeration, undoubtedly harmless, when in his final paragraph he declares that in the new conception "oligopolistic relations . . . [emerge] with greater force, as [do] . . . the full cost principle and other departures from profit maximization, and the relation of the theory to problems of development and growth" (page 362). I doubt that all this occurs merely through quantification of market interdependence via the cross-elasticity of demand. Also, as we have seen, the presumed departures from profit maximization normally constitute only poorly defined long runs substituted for short horizons.

V

Leaving the triopoly which has mixed the heady blends of "imperfect theory" of the past, I should like to turn to the surprisingly uniform doctrines on competition expressed at last year's meetings, written largely from an empirical base. The group already discussed shared,

initially at least, a common belief in real world departures from textbook purity of competition, and a parallel analytic attitude. A recoil from the fascination with monopoly diagrammatics and a new passion for competitive data, for some time inhibited, seems to have been released last year in a concerted move to turn the doctrinal cycle.

In mind, in essence but not detail, are the three papers by G. Warren Nutter, Richard B. Heflebower, and Arnold C. Harberger.[13] A penalty of some injustice to each of them is a price of brevity. However, I do not believe I misrepresent the spirit of their writings.

Last year we were told by Nutter that "it makes sense to say that competition is the normal condition in our economy. Theory should be brought back into touch with the world we live in by recasting monopolistic elements in their proper role: as a special, not the general, case." (AEA *Papers and Proceedings*, May, 1954, page 76.)

On the basis of his longer study he reported that segments of agriculture, mining, and manufacturing, accounting "for perhaps 10 per cent of national income," represented activities in which "competitive behavior . . . is continuous and prompt" (page 75). Industries classified as oligopolistic "account for as much as 35 per cent of national income," divided between those in which pressures of potential competition are strong (15 per cent) and the remainder (20 per cent) constituting "noncompetitive oligopolies." Thus "from these rough estimates, it would seem that about 45 per cent of national income is produced under continuously competitive conditions and an additional 25 per cent under irregularly competitive conditions" (page 76).

Heflebower remarked that "the general tenor of the argument, both as to the variables stressed and much of the empirical evidence referred to incidentally, is to suggest a strong tendency for economic results of industrial markets to be closer to the optimum than one would conclude from much of the literature about this sector of the economy" (*loc. cit.*, page 135). And, he adds: "It seems to me both evident and understandable, once one is versed in the whole of the structure and operations of modern industrial markets, that their operating results approach more closely the ideal than one would surmise to be true from textbook models of oligopoly and monopolistic competition or from the literature on concentration" (pages 138-139).

His opening sentence in the recent volume edited by Chamberlin

[13] I omit the slightly older lecture of G. J. Stigler, "Competition in the United States," in his *Five Lectures on Economic Problems* (London: Longmans, Green, 1949). His view that "competition declined moderately from the Civil War to the end of the nineteenth century, and thereafter increased moderately" (p. 54) was more tentative and less doctrinaire—in this place—despite the statistical scaffolding, than the authors quoted. Omitted also is Clair Wilcox' "On the Alleged Ubiquity of Oligopoly" (AEA *Papers and Proceedings*, May, 1950) in which he concluded that oligopoly was not "the ruling market form in the modern economy," contrary to views expressed by other writers.

reads: "Competition outweighs monopoly by a wide margin in the American economy today." ("Monopoly and Competition in the United States of America," in *Monopoly and Competition and Their Regulation,* 1954.) And though in resource adaptation, profit reduction, and income division, "the situation might be better," still "the economy as a whole, as operating now, reflects the presumed benefits of a competitive market system" (page 111).

Harberger, in an effort "to get some quantitative notion of the allocative and welfare effects of monopoly" (AEA *Papers and Proceedings,* 1954, page 77), confides, after identifying "monopoly power with high rates of profit" (page 84), "that monopoly misallocations entail a welfare loss of no more than a thirteenth of a per cent of the national income. Or, in present values, no more than about $1.40 per capita" (page 85). And: "Adjustment of our results to allow for a maximal distorting effect of advertising expenditures would accordingly make only a slight difference, perhaps raising our estimate of the welfare cost of monopoly in present values to $1.50 per capita, but not significantly higher" (page 86).

Appraising his calulations he feels they "tend to overstate" the "welfare loss due to monopoly misallocations of resources" (page 86) so that "monopoly does not seem to affect aggregate welfare very seriously through its effect on resource allocation" (page 87).

It is difficult to know what Nutter has in mind for the "general" case; surely it cannot be "pure" competition, much less perfect competition. For purity, at the firm's level, did entail adaptations which can hardly be true of industries such as agriculture and mining—often described as "sick" industries—and manufacturing sectors such as textiles. One of the virtues of modern analysis is its ability to cope with all market structures with a highly unified technique rather than exhibiting a predilection for one market arrangement as *the* descriptive form, as Nutter seems to be in danger of doing.

Heflebower goes even further in suggesting the proximity of our present world to the "ideal." Without information on the content of the latter, it is impossible to accept his judgment. What is the ideal output when user-cost calculations are recognized as reflecting a variety of opportunity costs? What is the ideal commodity-chain in an economy in which consumer demands for diversity prevent firms from exhausting decreasing cost opportunities? What is the ideal volume of sales outlays? What is the ideal rate of commodity innovation and product variation? The technological displacement of labor? To raise questions of this sort is to expose our ignorance. Ruefully, most of our welfare economics and optimal pricing propositions belong to a stationary model; the firms which Heflebower observes operate in a

more perturbed world. His assertion that "competition outweighs monopoly by a wide margin" is valid only where both terms remain vaguely defined.

I forbear comment on Harberger's calculations. Further study might lead to a revision of his estimates by another few pennies. Maybe even those who have argued that the economy approximated models of pure competition "in the long run" and "in equilibrium, excluding friction," were astonished at this remarkable statistical confirmation. I fear its statistical riches are too convincing, even embarrassing in providing too much.

In this whole discussion it is hard to resist quoting Chamberlin. Writing on attempts to classify "industries" as being monopolistic or competitive, he remarked that "the practice of classifying such 'industries' as *either* competitive *or* monopolistic . . . seems to me comparable to classifying all members of the human race as either geniuses or idiots." (*Monopoly and Competition and Their Regulation*, page 262.)

I do not propose to challenge the competitive-monopoly allocations of these writers at this place. Nevertheless, the determination that "only 20 per cent" of the income is being produced by noncompetitive oligopolies is not to be construed as signifying that resources are properly allocated in 80 per cent of the economy. There is a structural multiplier at work here; if industry A is classified as noncompetitive, not only are there resource maladjustments in A, but in all its flow-suppliers, and suppliers of suppliers, including the capital goods industries which provide equipment. In the same way, it is in error to argue that because income originating in advertising is only a minuscule part of national income it is unimportant. Without these earnings, many publications, radio stations, programs, etc., would cease; a series of interdependent incomes would topple, to say nothing of a reshuffle in demand. Demand for newsprint and paper, for printing presses, electronic devices, and certain transportation services would seriously dry up. The ultimate upshot would be a multiple of the small percentage of resources devoted to advertising as reflected in national income calculations.

VI

In summary, it seems to me that Harrod has oversimplified the pricing process. A cost-centered theory, long or short, can only be partly valid. Coerced to an arbitrary choice, a short-run maximization hypothesis is not without merit: it is reasonably definite and, considering that recent corporate profit and inventory valuation allowances approximate 25 per cent of current income originating in corporations, it does not seem too wide of the mark. If profits are not being maximized

there is real cause for alarm at the potential exactions from a psychological drift toward a short view.

Mrs. Robinson's recommendation that we work with a multiple-product firm ought to be welcomed. It is a pity that Professor Chamberlin failed to mention it, for it can be a realistic antidote even in the introductory phases of the theory of the firm. It follows that I prize highly the suggestion that the theory of price discrimination be brought to the fore, not as a special case, but one with wide applications of its own; substitute products turned out by multiple-product firms constitute an immediate area of relevancy. Further, in a temporal framework selling often partakes of the nature of discrimination over time, with the theory of inventory and speculation being essentially special cases in the broad genus. In this development the theory of bilateral monopoly also comes more securely into its own, sometimes as a form of discrimination inasmuch as sellers often deal with each buyer singly.

Mrs. Robinson's reference to time, in the clock sense, as well as her derogation of the long run, arouses interest. Yet she has not outlined her ideas adequately and there may be some clash in her espousal of long-run maximization simultaneously with condemnation of long-run analysis. This remains to be cleared up. Personally I should like to see a "dating approach," in the manner of the Swedish contributions, with the production-sales sequence occupying the center of the stage. I once tried to set out some plausible patterns which yielded interesting results, but I alone appear to have been intrigued by them. (See my *Price Theory*, Chapters 17-18.)

Though Professor Chamberlin's championing of the firm as the basic unit is generally accepted, and it ought be the multiple-product firm, fewer will acknowledge the U-shaped AC curve. A unanimous report here is unlikely, at least over the effective output-sales ranges. Notions of entry remain, as he articulately informs us, to be investigated anew, for entry being deleterious to economy on other than industry-fragmentation arguments encounters some natural resistance. Welfare economics may be especially delinquent for its shyness in diagnosing the problems created by entrepreneurial product variation.

Above all, the examination of monopoly in the dynamic milieu is sadly incomplete. Chamberlin's remarks are too brief and though we do have the ideas of Schumpeter, more remains to be said. Otherwise there is the danger of being swamped by the opinion of practical men that monopoly alone insures progress.[14] As a historical proposition, in an age of research staffs, something may be said for it, though it is

[14] See P. Hennipman, "Monopoly: Impediment or Stimulus to Economic Progress?" in *Monopoly and Competition and Their Regulation*, for some review of the literature

not a distillation that springs from careful research, for breaches in the fence of advance can be assigned to the same cause.

All seem to agree—though perhaps not Harrod—that the tangency solution is not vital to the analysis. As anything other than an *ex post* addition of profit magnitudes, or a special case, this is a relic of a faith in an ultimate stationary repose. Here again we tread on the conflict of long- and short-run analysis. Proponents have probably already chosen up sides.

Surprisingly, there has been no mention in these "revisits" of the role of funds and money markets as a possible limitational factor on the firm's activities and production decisions, despite the participation of two such gifted macroeconomic expositors as Mrs. Robinson and Mr. Harrod in the debate. It must always seem puzzling that the entrepreneur is conceived as maximizing profits, which entails access to loan funds, and yet problems of borrowing, of loan credit, and capital rationing are rarely mentioned in price-production analyses. Despite disclaimers, apparently we really do visualize unlimited credit or barter modes of compensation to factor-owners.

All three, it seems to me, despite recognition and reference, still place inadequate emphasis upon the subjective aspects of the pricing and production process.[15] Usually—and this is true of most of the literature—either subjective or objective demand-cost schedules are recognized, but not both. Harrod's concepts turn out to be pieces of subjectivism. Objective facts should somewhere enter the scheme and the compatibility of the two ought be demonstrated.

[15] Compared, say, to the cogent emphasis of F. Machlup, *Economics of Sellers' Competition* (Johns Hopkins, 1952), Chap 2.

DISCUSSION

FRITZ MACHLUP: We have been assured lately that we do not have to be afraid of monopoly in this country. Specifically, we have been told: that competition is the general case and the normal condition and its performance is not far from the ideal pictured in the old theories; that we have enjoyed a fine rate of technological progress thanks chiefly to our monopolies financing research and innovation; that thanks to big business or monopoly we enjoy a larger scope for freedom of choice and can satisfy a greater diversity of tastes; that bilateral monopoly is a blessing taking the curse off most of the unilateral monopoly that has sprung up; and that whatever monopoly we have costs us only $1.50 a person per year. Thus, we can rest assured and forget our persecution complex, and perhaps also our prosecution zeal against suspected antitrust law violators.

The two speakers in today's session do not share such views; they seem to take the social cost of monopoly, the danger of reduced competition, and the advantages of vigorous competition much more seriously. Professor Clark tentatively lists "public policy expressed in the antitrust laws" among necessary conditions of vigorous competition and he seems to advocate that collusion be checked and the competitively-minded individualist be protected. He does not accept the view that countervailing power is as good as competition, he objects that a major part of competitive behavior—bargaining with all your might—was "annexed" as a phase of countervailing power, and he states that under bilateral monopoly "almost anything might happen."

Professor Weintraub does not accept the view "that monopoly alone insures progress." And although Professor Clark mentions that "atomistic industries" would lack the funds as well as the incentive to undertake heavy research programs, he emphasizes the function of competition in the diffusion of the benefits of progress -in re-creating incentives for new ventures after eroding the profits from the previous ones. His remark that incentives to innovation could not exist "if the diffusion were instantaneous and complete" is probably intended to convey his opinion that the innovator's head start would be insufficient if imitators were not delayed by some institutional barriers such as the patent system. But how long a delay would be appropriate to achieve optimum rates of innovation and of diffusion of benefits? As I have stated in my *Economics of Sellers' Competition* (1952):

> To buy innovation by paying with unnecessarily long delays of imitation is a poor bargain for society to make. Imitation always and necessarily lags behind innovation. It will be the best deal from the point of view of society if innovators optimistically overestimate this lag. If they expect the lag to be longer than it actually is, innovation will be enhanced and imitation will not be delayed. That it may create this socially wholesome illusion on the part of innovators is the strongest justification for a well-designed patent system. (Page 556.)

The worst bargain for society would be patent laws or other monopolistic barriers which protect the innovator better than he thinks they do. For this would delay imitation without stimulating innovation accordingly. While Clark does not discuss this problem, his comments on the need for the erosion of

profits by competition and their re-creation through further innovation indicate to me that he might accept my way of thinking on these issues.

Weintraub is critical of the views of the all-is-well economists. He does not examine the cost-accounting methods behind the surprisingly low estimate of the welfare cost of monopoly, but he reminds us of the fact that Harberger identified monopoly power with high rates of profit. Many writers on the subject have insisted that monopoly is reflected less in increased profit rates than in increased or inflated costs. A monopolist may pay more than the competitive price for productive services; he may use them inefficiently; he may have transformed his monopoly rents into money expenses; he may have capitalized them, inflating the base on which his rate of return is calculated. (See my *Political Economy of Monopoly* [Johns Hopkins Press, 1952], pages 490-497.)

High production cost behind monopolistic barriers, such as tariffs, patents, building codes; high depletion cost in mineral monopolies; high management cost and high labor cost in enterprises sharing their profits with management and with their labor force—these are some of the economic consequences of monopoly excluded from Harberger's estimate of its welfare cost.

Not in such political or evaluative implications, however, but rather in their theoretical contributions lies the chief value of Clark's and Weintraub's papers. Weintraub's survey of what Harrod, Joan Robinson, and Chamberlin had to say when they revisited their earlier explorations is highly suggestive. Clark's "dynamic criteria of appraisal" of the goals and performance of competition is a piece of theorizing distinguished by a rare combination of analytical technique and mature wisdom.

The call for dynamic, more dynamic, and fully dynamic theory is repeated over and over again. I fear that the dynamics of the meaning of the word "dynamic" is too great for the term to be of continued usefulness if we want to communicate and not only to orate. Clark wants to communicate, I know, and therefore I take the liberty of commenting a bit on his choice of language.

He speaks of a gap between theories of equilibrium and theories of growth and development. As I see it, equilibrium is a tool of thinking needed to explain change, no matter whether it is change in market prices or in business investment or in employment or in the rate of growth. Equilibrium is a valuable concept both in models which disregard time lags—static theory—and in models which present sequences in time—dynamic theory. Since a theory of growth will ordinarily use the equilibrium concept, there can be no contrast between theories of equilibrium and of growth. What Clark meant, I suppose, was the contrast between "static theories of price and output" and "theories of growth and development."

Price theory itself may be static or dynamic. I once gave a graphic description of a "dynamic or time-sequence analysis of effects of a selling campaign," in which five different outcomes—different sales volumes at one price and different prices for one sales volume—were shown to result from a given selling effort, depending on the chosen sequence of actions and on the time intervals between the steps. The five points would all coincide if sequences and intervals of time did not matter and demand curves were assumed to be reversible

(*Economics of Sellers' Competition*, pages 185-189). Whether the complicated dynamic model has to be used or the simple static model will do, depends on the kind of problem at hand; that is, not on whether sales actually depend on the time sequences and intervals but on whether the differences really matter for the kind of answer required. Clark gave a very similar description but did not say whether he believes that the dynamic model is always superior. If he thinks so, I would disagree. Dynamic theory is better only where it is needed; where the analytic job can be done with the simpler, less realistic, static theory, the latter is preferable.

"Fully dynamic theory," Clark says, "must accept indeterminateness." I suppose he means to suggest this as a definition; namely, that a theory which is both dynamic and indeterminate should be called "fully dynamic." I do not know whether this would be helpful. Oligopoly theory, to be sure, will usually have to be dynamic, will have to make large allowance for uncertainty in the anticipations of sellers, and will have to leave a large scope for indeterminateness. (See my chapter on "Oligopolistic Indeterminacy," *op. cit.*, pages 414 ff.) I should prefer to use language which does not mix the dynamic elements, the uncertainty elements, and the indeterminateness, since all these are different things that ought to have separate names.

There is no disagreement of substance between Clark and myself on the dynamics of oligopolistic competition. I find his emphasis on the time interval between move and countermove as a key element in the theory of oligopolistic competition most appropriate and significant.

The tangency theorem comes in for a good deal of criticism, and in at least one respect Clark's objection coincides with Harrod's, reproduced by Weintraub: businessmen are not so shortsighted as to overlook potential competition; hence they may ward it off and secure larger sales volumes by charging lower prices. I believe that the proponents of the tangency theorem had only the case of a polypolistic seller in mind, who would regard himself as too small to arouse any responses on the part of competitors, old or new. The theorem was not meant to apply to the case of oligopolistic competition under the pressure of new entry, actual or potential.

Clark's remark on product differentiation as a competitive device confirms my own conclusions that quality competition can be quite vigorous and that product differentiation may weaken but will often invigorate competition. I also showed that product standardization may be an aid to price competition, but is often an aid to price maintenance and other forms of collusion (*ibid.*, pages 163-168). But may I take exception to the way in which Clark put his comment? He said that "theory appears to regard product differentiation as always a shelter from the rigors of competition." My theory, for one, does not. Clark obviously meant "some theorists." After all, no theorist is appointed or ordained to speak in the name of "theory."

Twice in his written paper Weintraub made bitter or disconsolate remarks about the fact that his fellow economists have sadly neglected certain important points he had made in his book on *Price Theory*. I know exactly how he feels. When I first read Clark's paper, at eight different points I cried out: "Oh

why has he not read my book! ! !" Well, I suppose, there just is not enough time to read all we want to read.

And perhaps I may turn the tables on Professor Weintraub and ask him whether he has read what Milton Friedman recently wrote about that funny ambition of some social scientists to verify the fundamental assumptions of a theory instead of the conclusions deduced from them? I am asking this apropos Weintraub's remarks about "operational testing" of the assumption of profit maximization. After complaining about the impossibility of the assumption of long-run profit maximization, he says: "Of course, it may be alleged that businessmen seek to maximize their long-run profits, not that they succeed. This is a very different theory indeed." It "is hardly a theory of long-run maximization in any objective sense. It barely transcends the platitude that whatever he thinks is right, he does." I cannot resist quoting the answer which I gave to this a few years ago:

> My emphasis on this methodological "subjectivism" has been widely criticized. One of my critics believes that "refuge in subjective interpretations of the cost and revenue functions . . leaves theory saying that businessmen do what they do because they do it." (R. A. Gordon, . . . AER, 1948.) This is a misunderstanding The businessman in the model acting upon marginal principles will react, say, to an increase in the price of fuel oil, not just by doing anything that may come to his mind, but by making some "typical" adjustments in his production, input, output, and prices. The point is that, in order to predict or explain the type of adjustment, we do not have to know the subjective whims and guesses that may have influenced his initial position. For, happily, the direction of the "equilibrating" (adjusting) action is to a large extent independent of the exact position of "equilibrium" from which we assume the businessman has been pushed by the "disequilibrating" change. (*Ibid.*, page 36.)

I propose a pact to Weintraub: that we shall read each other's books and discuss our disagreements.

Kermit Gordon: If I sense correctly the tone of Mr. Weintraub's paper, he is disturbed by what he regards as the immoderate character of the current wave of revisionism in both the theory of markets and in the appraisal of market behavior in the American economy. I share his uneasiness.

The pendulum was bound to swing, and a swing in the present direction was, I think, salutary. Abuses were unquestionably committed in the name of the new theories of competition which were unveiled in 1933. Illustrative firm demand curves were sometimes drawn with a slope such as to suggest that in group equilibrium the scale of the firm would be comparable to that of an itinerant peanut stand. The assumption of short-run profit maximization was accepted much too uncritically. There was attributed to entrepreneurs a precision of knowledge with respect to their cost and demand functions which they obviously do not possess; witness Mrs. Robinson's recent acknowledgement, by way of expiation, that the firm's demand curve "is a mere smudge, to which it is vain to attribute elegant geometrical properties." The concept of the "group" or "industry" was taken much too literally, with the result that the analysis of substitutability relations was unduly circumscribed. And, of course, the whole analysis suffered from being conducted in a static framework.

But all of these matters are commonplace and have been for some time now.

What concerns me—and I think Mr. Weintraub—is the sense that the wave of revisionism has developed a momentum which threatens to carry it into some salients which cannot be held. There is even the possibility that some of the current themes may be mutually inconsistent. Two of these themes, for example, may be linked in the following curious proposition: the pervasiveness of monopoly power in our economic system has been favorable to a rapid rate of technological progress, and anyway, there is very little monopoly power in our system. I would not hold that the two parts of this proposition are necessarily irreconcilable, but I would maintain that those who assert both parts to be true have some explaining to do.

Mr. Weintraub examines at considerable length the views expounded by Mr. Harrod in his recent essay, "Theory of Imperfect Competition Revised." A reading of this essay leads me to ask, I suspect with Mr. Weintraub's approval, "Are these revisions necessary?"

Mr. Harrod would like to erect in the very center of price theory the concept of limit pricing to deter entry. In his view, entrepreneurs may be counted on to set prices at levels sufficiently below those indicated by the geometry of short-run profit maximization to render their markets unattractive to potential rivals. This principle leads Mr. Harrod to discard the doctrine of excess capacity and enables him to demonstrate the compatibility in certain circumstances of full-cost pricing with marginalism.

There is, of course, nothing very new or startling about the proposition that limit pricing is a fairly common phenomenon; it may be found in the textbooks. Serious doubts are raised, however, by two facets of Mr. Harrod's analysis: the apparent assumption that the full exploitation of short-run profit opportunities will, by attracting entry, generally entail the sacrifice of a greater sum of discounted future earnings, and the view, implicit rather than explicit, that limit pricing is typically employed for the purpose of deterring entry.

Mr. Weintraub has discussed the first of these points at some length, and I would associate myself with his misgivings. However misleading it may have been to imply that entrepreneurs typically act on the maxim, "Gather ye rosebuds while ye may," there are nevertheless important questions to be asked about Mr. Harrod's presumed substitute, "A stitch in time saves nine." One would want to know a good deal more about how many stitches are in fact saved by a stitch in time (it puts no strain on the imagination to think of cases in which nine stitches in time might conceivably save one); about the distribution over time of the stitches saved; and about the rate of time preference applicable to these stitches.

Mr. Harrod rests his case for limit pricing in part on the proposition that "the uncertainties of the future have a tendency to restrain the monopolist from raising his price much above a competitive level, even if all known factors indicate that he could do so with safety." But doubts arise if we look for the causes of this uncertainty. It would be popular current doctrine to hold that entrepreneurial uncertainty about the future arises in large part from fear of the "kind of competition which counts"—in Schumpeter's words—"the competition from the new commodity, the new technology, the new source of supply,

the new type of organization . . . competition which commands a decisive cost or quality advantage and which strikes not at the margins of the profits and the outputs of the existing firms but at their foundations and their very lives." But does this kind of anxiety foster limit pricing? Will the voluntary narrowing of profit margins fend off this kind of competition? Would moderation and restraint in the pricing of ice have stopped the electric refrigerator? I think not, and I would suggest the odd hypothesis that the perennial-gale doctrine is at least as easy to reconcile with a relatively short-run theory of profit maximization as with a long-run theory.

The second basic reservation I have about Mr. Harrod's analysis is the feeling that the motives for limit pricing are much more complex than he suggests. On the basis only of the most casual and unsystematic observation, I would hazard the guess that the conscious design to discourage entry is present only in a small proportion of those cases in which limit pricing occurs. One thinks immediately of the concentrated sector of American manufacturing industry in the two or three years following 1945. Limit pricing was widespread, but in many of these industries any serious fear of entry which may have existed could have had no firmer basis than neurotic anxiety. The automobile industry, by holding prices below the short-run equilibrium level, created an army of frustrated potential buyers. Yet if the automobile manufacturers had really been seriously concerned about the possibility of entry, which I doubt, they might have been better advised to raise prices to the equilibrium level for the purpose of eliminating the waiting lists; for these waiting lists, one might argue, were a clearer and more unmistakably inviting signal to potential entrants than very high profits would have been.

Mr. Chamberlin is, of course, not to be grouped with the ardent revisionists: it may be noted that the title of his essay uses the word revisited, not revised. I find little to quarrel with, either in Mr. Chamberlin's exposition of his present views or in Mr. Weintraub's summary of Mr. Chamberlin's position. I am a little sorry, however, that in the interest of theoretical purity and analytical elegance, Mr. Chamberlin has decided to part company with the concept of the group. Indeed, in another place, he deals even more harshly with the related but looser concepts of industry and community, castigating them as a snare and a delusion.

The argument here is a familiar one, and few would be disposed, given the usual premises, to question the pure logic of Mr. Chamberlin's position. It has been clear—at least since Mr. Triffin's book—that these group concepts are treacherous, tending to conceal variations in substitutability relations within the group and the existence of substitutability relations across group boundaries. The dangers, moreover, are not merely presumptive. Most of us have run across empirical work in which these group concepts have in fact "snared and deluded" the authors. And one can sympathize with Mr. Chamberlin's exasperation when someone draws inferences with respect to the size of the price-marginal cost gap from a calculation of the concentration ratio for the cast-iron lawn dog industry. In defense of the group concept, however, I am moved to say that anyone who could commit such a crime would, in the absence of the group concept, do something else just as foolish.

It would be a mistake, I think, to blink the fact that industries do exist; they were not just thought up by economists. They are institutionalized in thousands of national trade associations. Firms view themselves as members of industries. They do not in fact think of themselves as cast upon a sea of cross-elasticities which extends in every direction as far as the eye can reach.

It might be objected that these are institutional considerations which have no place in a discussion of pure theory. I would suggest, however, that the viability and growth of the trade association and the apparent strengthening of the firm's identification with the industry tend to lend plausibility to the hypothesis that these arbitrary industry boundaries do in many cases correspond roughly to significant breaks in the chain of substitutes. If this were not so, it would be hard to explain why trade associations, given their usual objectives, have fared so well.

More important, however, is the proposition that the identification of the firm with the industry causes the firm to behave differently than it otherwise would. Trade associations play an important role in the process of price and output determination; and the institutional framework to which he is attached conditions and modifies the businessman's perception of cross-elasticity relations. If the industry concept tended only to narrow the economist's view of the ramifications of competitive relations, there would be no loss in abandoning it; but if it tends also to narrow the businessman's view, as I suspect it may, then it would be a mistake to banish the group concepts from the halls of price theory.

Lest I be accused of a temperamental affinity for the *status quo*, I want to call attention briefly to at least one aspect of monopolistic competition theory which seems to me in need of revision. The argument is not a new one—the essential point having been made in 1918 by J. M. Clark and a few years later by Frank Knight—but it has been overlooked or rejected in the development of the new theories of competition. It relates to the treatment by Chamberlin and others of the selling cost problem. Most economists have followed Chamberlin in drawing a sharp distinction between selling costs and production costs. In Chamberlin's words, ". . . of all the costs incurred in the manufacture and sale of a given product, those which alter the demand curve for it are selling costs, and those which do not are costs of production . . . those made to adapt the product to the demand are costs of production; those made to adapt the demand to the product are costs of selling."

This distinction will not, I think, stand critical analysis. It would seem to be based on the questionable premise that the concept of product embraces only those material qualities which would commend themselves to an industrial purchasing agent or a home economist. Hence the notion that only production costs can alter the product. Yet on the other hand we are told that the test for homogeneity or heterogeneity of product is a psychological, not a material, test—the test of buyer indifference. This doctrine would suggest that products can be altered by producer activity which does not in any way affect the material qualities of the good; i.e., selling costs.

Economists have been reluctant to accept, or at least to incorporate into their economic thinking, what every good advertising agent knows to be

true: that in an opulent society such as ours, consumers are frequently more attracted by the sizzle than by the steak. Consumption decisions are often determined by the talismanic attributes of goods rather than by the objective qualities which fit more neatly into the rationalistic tradition of economics. Opulence surrounds the basic physical wants with a host of social wants which people try to satisfy through the consumption of goods. And the clear evidence of consumer behavior would suggest that the talismanic attributes of goods—the creation of which is one of the main objectives of modern advertising—are regarded by buyers as capable of satisfying these acutely-felt social wants.

If this view is correct, the commonly accepted sharp distinction between production and selling costs would appear to be untenable. What, after all, is the difference in principle between the type of cost entailed in lengthening the hood of a Cadillac, in order that greater prestige shall attach to the ownership of a Cadillac, and the printing of an advertisment showing a Cadillac standing in front of a country club, in order that greater prestige shall attach to the ownership of a Cadillac? And yet it is the custom of economics to regard the one as altering the product and the other as altering demand—the custom, even, of the less cautious among us to categorize the former as progress and the latter as waste.

Inconsistencies such as this suggest that we might well abandon the sharp cleavage between production and selling costs in favor of a view of the matter which is compatible with the subtle and evanescent character of consumer wants in an opulent society.

GARDNER ACKLEY: I must begin by saying that there is little in Professor Clark's paper with which I find myself able to disagree. As is always the case with whatever subject Professor Clark touches, the result is illumination and stimulation.

There were a few minor points out of the number he makes with which I might have picked an argument; but even these turned out, when I attempted to develop them, to become largely issues of semantics. I have decided, therefore, to use my few minutes for what might be considered a methodological matter. It relates to Professor Clark's fundamental thesis that our theories of competition, to be realistic and to be useful in policy, must be made dynamic.

I expect that there can be no disagreement—indeed it is a commonplace—that our economic theories need to be dynamic. The trouble is that the word dynamic does not always have a very clear or specific meaning. As someone has remarked, dynamic is merely an adjective which distinguishes one's own theories from everyone else's.

I wonder, therefore, if it would not be useful to specify rather clearly what we may mean by a dynamic theory of competition before we proceed to construct or to criticise one. I may say in advance that it is my feeling that Professor Clark has not given a very clear or consistent meaning to dynamic theory and that this may be responsible for my impression that his paper represents mainly a series of somewhat disconnected observations. I find many of these observations individually very penetrating and stimulating; but

nevertheless the thread which ties them together is sometimes hard to find.

Just what is the distinction that Professor Clark means to imply in his contrast of "static models and dynamic aspects"? In the very first sentence of his paper reference is made to "the gap between theories of cost-price equilibrium and theories of production, growth, and development." Only a few sentences later we have it that dynamic theories "include the tendencies toward equilibrium. But because these tendencies never reach their static limits, dynamic theory cannot use any features which are needed only to enable a model to attain this impossibly precise completeness. . . ." Still later we read that "a theory of competition as dynamic process must be not a model but a framework within which many models may find their places, including equilibrium models as limiting hypothetical cases." This is about all that I find which refers explicitly to this contrast of static versus dynamic theories. There is, however, also an implied definition of dynamic in the substantive matters and problems which Professor Clark chooses to discuss.

Leaving aside for the moment Clark's particular meaning, what meanings might we give in general to this contrast of static with dynamic?

I assume that we agree quite generally that static refers to an analysis of states or conditions of equilibrium. Given the values of certain outside or exogenous factors, there is (or may be) one pattern of the internal or endogenous variables from which all tendencies to further change would be absent. This pattern represents an equilibrium situation.

Now, because equilibrium is a situation from which change is, by definition, absent, equilibrium theory has frequently fallen into the trap of eliminating from consideration those things which are the inevitable concomitant of change—most of all, uncertainty. If equilibrium is a prediction—a state which will someday be reached—then this is legitimate. But if, as I assume it usually is, it is only an analytical device, then there is no excuse for eliminating from the description of behavior the effects of change and uncertainty. To put these back into static theory, then, is a first step toward making theory dynamic.

Some of Clark's dynamics consist precisely of this. It seems to me that much of what he has to say about the content of long-run and short-run cost curves and about Chamberlin's tangency theorem is merely an improvement of the static analysis by the recognition of the effects of change and of the uncertainty which change generates.

To introduce the effect of change and uncertainty into our demand and supply curves is an important step. But it is still not part of what I would consider a true dynamics: an analysis in which the concern is with processes of change. Nor does Professor Clark stop with this first step.

As we have come increasingly to realize, in order even to define the existence of a stable equilibrium, we need at least some rudimentary dynamics. These have always been implied in all of our equilibrium models, but they have often been inadequately explored. The question is: How do sellers (buyers, factor suppliers, et cetera) behave when equilibrium does not exist? What precisely is the nature and the time sequence of their behavior? How do they respond, and when? Only by investigating these questions can we be sure that an

equilibrium, or at least a stable equilibrium, exists. And the properties of the equilibrium depend on the nature of the disequilibrium behavior.

A great deal of the substance of what is now called "dynamic analysis" is merely an explicit exploration of the way in which equilibrium is approached. A comparative statics analysis concentrates on previous and the new equilibrium positions and ignores the process of change from one to the other. A dynamic analysis shows the time sequence and pattern of movement between the two equilibrium positions.

This type of dynamics may also recognize that full equilibrium is rarely or never achieved. Changes in the exogenous variables may be so rapid and so extensive that the system never reaches one equilibrium before that equilibrium is replaced by another. As a well-known text once put it, the dog continues to chase the rabbit (equilibrium), but the position of the rabbit continually changes. To understand the behavior of the dog we need to know where the rabbit (equilibrum) is at any time, even though we know that the dog will never catch him.

What would be the content of the analysis of competition which corresponds to this rather narrow concept of dynamics? It would deal, I think, with several of the questions that Professor Clark discusses. When he talks of the process of profit erosion, and its duration, he is, it seems to me, discussing the dynamics of the approach to equilibrium. Technological change or other disturbances to equilibrium occur. What is the sequence of events by which the market adjusts—through innovation, imitation, and competitive response to this initial change?

This, too, is important and useful. And it requires explicit recognition, as Clark urges is necessary, of the time lags in the process of market adjustment.

But there is another and broader content to economic dynamics—the content which Clark suggests when he contrasts theories of equilibrium with theories of growth and development and which he deals with several times in the substance of his paper. The narrower dynamics retains an essential tie to statics; it merely investigates more explicitly the processes involved in "tendencies toward equilibrium." But the broader type breaks more fundamentally with the equilibrium concept. In the broader dynamic analysis, movements of variables represent not merely the working out of tendencies toward equilibrium. Rather, processes of change are seen at least in part to be irreversible, self-generative, and self-determining. Change is a product of previous change, as well as of other current variables. Partly, this is a matter of bringing into the analysis, as endogenous variables, factors which the equilibrium analysis took as exogenous. Thus we would attempt to explain, at least in part, such things as the state of technology, the number of sellers, the evolution of buyers' tastes, the nature of the market institutions (such as the form of price quotation and methods of sale), the attitudes of sellers toward their rivals' moves, their long-run versus short-run horizons, et cetera. These would be things to be explained rather than to be assumed.

But the broader dynamics to which I refer does more than merely to enlarge the list of variables. It also, as I have indicated, considers the factors responsible, not only for the levels, but for the rates of change of these

variables. When Professor Clark sets up his criteria for appraisal of market performance, he is clearly thinking very specifically in these terms. He is concerned with whether a particular market situation is productive of a more or less rapid rate of introduction of new processes and new products, with the nature and speed of product evolution, and with the speed of the creation as well as the erosion of profit opportunities. And he has some very interesting things to say about these.

All of these contributions toward a more dynamic theory are important and useful. But if we are trying to provide a general framework for a dynamic theory of competition, we probably need to recognize more explicity than I think Professor Clark has done that dynamic can have several meanings. And I believe that we must develop somewhat separately the appropriate theoretical tools as well as the substantive content of these several levels of analysis. As is the case with other branches of economic theory, the dynamic analysis of competition and markets is still in the stage of foundation laying.

Professor Clark has given us some sketches of a few elevations of the structure. But it is still a little early to tell what the building will look like when it is completed.

THE IMPACT OF ANTITRUST LAWS

VERTICAL DISINTEGRATION IN THE MOTION PICTURE INDUSTRY

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In July, 1938, the Department of Justice filed its antitrust action, *U.S.* v. ***Paramount Pictures,*** in the Federal District Court of New York, and in May, 1948, the Supreme Court, speaking through Justice Douglas, affirmed the government's hard-won victory. The five so-called "majors"—Loew's, Paramount, Twentieth Century-Fox, RKO Pictures, and Warner Brothers—were ordered to dispose of their theatrical holdings, and they and the three non-theater owning defendants—Columbia Pictures, Universal Pictures, and United Artists—were enjoined from certain monopolistic or discriminatory practices. One of these was renting films to theatrical circuits on a circuit-wide basis, to the disadvantage of competing independent theaters. Another was "block booking," or conditioning the offer of one film on the purchase of another, often (prior to 1940) by licensing the coming year's product in one transaction. The eight companies must now, therefore, rent their films "theater by theater," and, except where a noncompeting theater negotiates for several at once for convenience, "picture by picture." This is important, because the eight not only produce most of the domestic features but distribute—that is, negotiate the rental to exhibitors (theater owners)—some imports and many domestic features produced by independents.

The government convinced all eleven sitting judges of the District and Supreme Courts that the defendents had conspired to restrain trade and monopolize. Although the five majors had full or part ownership of only one-sixth of the 18,000 theaters, so many were first-run houses in big cities that they took in a much larger percentage of all box office receipts. Not only did all eight defendants' features usually appear first in these affiliated theaters but the majors had sometimes used their control over the film supply to force independent exhibitors to sell out to them or accept partnership arrangements. The remaining independents were in general relegated to "subsequent runs," behind a "clearance" of some stipulated number of days after the close of the next prior run.

These were some of the conditions that the government and the courts hoped to cure by divorcing theaters from the producing and distributing branches of the industry and by prohibiting such practices as block booking. Between 1948 and 1954 the integrated companies

were successively split by five consent decrees into two parts each, creating five disaffiliated theater circuits—which, in turn, were allowed a period of time to sell a quarter to a half of their theaters. Although many cynics suspect that these corporate pairs continue under common control, the evidence is that they deal with each other at arm's length.

The Paramount decrees represent the most important experiment in vertical disintegration under the Sherman Act—one of greater potential significance than the separation of anthracite mines and railroads ordered in 1920 or of Pullman car operation and manufacture ordered in 1944. I shall treat separately the effects on (1) exhibitors, (2) independent producers, (3) the defendants themselves, and (4) the public.

The aim of the whole case was to win for exhibitors protection against being forced to sell out if their location and policies proved profitable, against being forced automatically into subsequent runs behind long clearances, and against being forced to accept bad films as the price of getting good ones. The first two aims were also those of the "circuit" decisions, *U.S.* v. *Griffith* and *Schine Chain Theaters* v. *U.S.*, which Justice Douglas announced on the same day in 1948 and in which the Supreme Court found that the large, although nonaffiliated, circuits had been using their buying power to gain unfair advantages over smaller theaters.

These aims have been realized. If, for example, an exhibitor thinks he can prove that the location, size, or other characteristics of his theater deserve an earlier run, there are lawyers who will help him, on a contingent basis, to sue the eight companies under the treble damage provision of the Sherman Act. What Justice Douglas called their "marked proclivity for unlawful conduct" will be prima facie evidence on his behalf, and, under the precedent of the Jackson Park case (*Bigelow* v. *RKO*), decided by the Supreme Court in 1946, his damages may be estimated liberally. The producer-distributors, under this threat and the courts' 1948 injunction against discrimination, and because they have no reason now to favor their formerly affiliated circuits, are apparently granting "availabilities" to theaters equitably. The motion picture decrees, in the light of their aims, can be classed as highly successful.

The first qualification appears when we ask how many exhibitors have been helped in practice. Since an injunction to discontinue their theater expansion programs had been issued against the majors in 1940 as part of an earlier consent decree (which the government decided in 1943 to abandon), divorce may not have been necessary to save many independent exhibitors from being bought out. There are no figures

as to the number of theaters which have advanced their runs, but a questionnaire of my own, sent to 221 exhibitors and answered by 41, disclosed that only three of these had stepped up. Of my 41, 12 noted a shortening of the clearance after the first run in their towns, the average change being from fifty-six to thirty-three days. In the remaining towns, this clearance had averaged only twenty-three days and is unchanged. Apparently, and fortunately, it is the unreasonably long clearances which have been reduced.

The mere fact that only a minority of theaters had received a practical gain would not explain why this successful decree is so unpopular. Criticism of the outcome is a regular refrain in the opinion columns of the several trade magazines read by exhibitors. The Department of Justice has received more complaints against the decree than against any other in history. The Senate Small Business Committee held extensive and inconclusive hearings on it in 1953. The Theater Owners of America, the largest trade association of exhibitors, demands that the Department of Justice drop its veto on vertical integration. This change in attitude calls for explanation.

First, the decree is blamed for the "product shortage," or reduced flow of feature pictures. The big decline has come in 1954, in which the number of domestic features released by the "national distributors," or members of Eric Johnston's Motion Picture Association of America, has declined by more than 20 per cent. The case of RKO, which never got into full swing again after it had shut down its studios for a period in order to "root out Communists," is extreme; but the major studios generally have reduced their output, and smaller studios have turned predominantly to manufacturing grade B's for television. The theaters have had to fill their screen time with independent and foreign films and reissues and by giving some features a longer playing time.

The majors explain their part in the product shortage very simply: they have found that, when pictures are only moderately better than those on television, people stay home. Their deliberate policy, therefore, is one of better pictures, even if the higher cost per picture reduces the number made. But divorcement has played its role. Formerly a big company would release a feature a week, one aim being to keep the screen time of its affiliated theaters occupied. Now this motive is gone. Moreover, with block booking abolished, the producer can no longer count on renting a year's output, good and bad alike, ahead of time; he must make sure that each picture is salable on its own merits; and this suggests more attention to each one made and less scattering of efforts.

The exhibitors view the reduction in output as a conspiracy to raise

prices by reducing supply. The Allied States Association—second largest exhibitor organization—has considered the possibility of investing in the stocks of motion picture producers and then voting for directors who would increase production schedules. The Theater Owners of America endorses the proposal of National Theaters, the former Fox circuit, to go into picture making (which the Department of Justice has vetoed) and plans to raise 10 million dollars to finance independent producers. The very reason which stimulated William Fox to originate moving picture integration in 1910 in his battle against the Motion Picture Patents Company, the trust of that day, and which inspired the First National Circuit in 1917 to build studios in its fight against Paramount-Famous Players-Lasky Corporation, the trust of *that* day, is at work again: to assure a supply of the raw material. This is the same motive that causes oil refiners to go into crude production and steel mills to search for iron ore.

A really bitter complaint of exhibitors is against the rise in rental terms, which both distributors and exhibitors agree has occurred. A poll of theaters conducted for COMPO (the Council of Motion Picture Organizations, which represents producers, distributors, and exhibitors) disclosed that in 1946 they paid an average of 31 per cent of their box office receipts as film rental and in 1953, 36 per cent. This would account for 5 points of the estimated decline from 14 to 2 in average theater net profit as a percentage of box office receipts. Evidence also shows that the smallest theaters have been the hardest squeezed.

This upward shift in rentals, due in large part to the trend toward fewer, more expensive films, is linked with divorcement in another way, also. The big producers, no longer owning theaters and making their money on film rentals rather than at the box office, have become sharper bargainers. This is well illustrated by the 70 per cent (twice the average figure) which is now being demanded for some of the big features like *The Robe* and *The Caine Mutiny*. Moreover, competitive bidding has replaced bilateral negotiation as the means of settling terms in many hundred "situations." When the District Court originally ordered bidding, the Supreme Court eliminated the order; but it has developed anyhow. The Paramount decree having opened the possibility of an earlier run for independents, the question arose who was to get a feature which two or more theaters wanted on the same "day and date." Two solutions emerged: when the competing exhibitors were friendly, they would adopt a "product split"; that is, would alternate the sequence in which they showed successive features (thus violating the antitrust law, although with no risk of prosecution); otherwise the distributor could avoid accusations of favoritism only by asking for sealed bids.

One who makes a sealed bid is tempted to offer as much as he can afford, whereas in a straight negotiation he can bargain, hold his cards close to his chest, and threaten to walk out. The resulting rental rise in bidding situations is more important than the question whether some distributors handle bids unfairly, as unsuccessful bidders may claim. Unsuccessful bidders often include independent theaters which have demanded early runs but cannot outbid their larger rivals.

The Allied States Association, after vainly demanding that rentals be made subject to arbitration—a demand which won sympathy from neither distributors, the Department of Justice, nor the Senate Small Business Committee—has turned to a proposal that the industry be declared a public utility and its wholesale (not retail) prices regulated by the Federal Trade Commission. This threat, it hopes, can be traded for lower rentals.

A third reason why exhibitors are not happy about the decree is the abolition of block booking. The time and cost saving in buying all at once was considerable, the assurance well ahead of time that they could plan on their features for the big holidays was pleasant, and their hope of finding a "sleeper," or good film whose potential would emerge only upon its showing, matched their expectation of being given some "dogs" which they might not even want to run. On my questionnaire, twenty-nine exhibitors expressed the wish to have block booking restored as against eleven who opposed it and one who did not care. Some noncompeting theaters buy several pictures at a time today, but distributors are likely to frown on this because of legal doubts or the belief that renting one at a time makes it easier to get the maximum price for each.

Before leaving the exhibitors, I must at least mention the new and powerful forms of competition which hit them just as they were hoping to profit from the Paramount decree. With television we may lump all the new influences that keep people out of theaters, from night baseball games and tending suburban gardens to the cost of baby sitters and of parking space. A COMPO survey showing a continuous decline in theater net income from the 201 million dollar peak in 1946 to 24 millions in 1953 is consistent with the estimated 45 per cent decline in attendance. The same source reveals that in 1953, 29 per cent of theaters were losing money and another 38 per cent making it only because of concessions, of which popcorn earns the most profit.

The second new type of competition has been the drive-in theater. Between 1946 and 1954, COMPO gives their number as increasing by 3,750, while that of "four-wall" theaters declined by 4,400. The greater impact of television and drive-ins has taken the attention of some four-wall exhibitors off the antitrust situation but made others

all the more anxious to pull some rabbit out of that hat. On my questionnaire, seven called the Paramount decree good, eleven called it bad, three (correctly) said it was both, and twenty had not felt it at all.

To the independent producers, I can give only a few words. The government hoped that, once the majors owned no theaters, independents could dispose of their pictures in an open market. It is true that far more independents are active now than a few years ago, but apparently not because of greater ability to get their pictures into theaters. There were always more than 15,000 theaters that had no ties to majors; even the producer-owned theaters did not dare pass up box office hits like *The Best Years of Our Lives* or *Snow White and the Seven Dwarfs;* and most good independent films have always been released through the distributing offices of the eight defendants or even, as in the case of *Gone With the Wind,* financed in part by them. More important than the decree in accounting for the rise of independents is the increasing preference by the majors for profit participation plans as against the fixed charges of salaries of directors and stars, along with their declining production schedules which give them studio space to rent out.

The defendants, as has often been the case after antitrust defeats, seem not to have suffered very seriously. Their earnings are sharply lower than in their big years, 1946 and 1947, but television and other substitutes for the movie habit offer an adequate explanation. With the rush of successful pictures since 1953, perhaps aided by program boredom on the part of those who have owned TV sets several years, their profits have at last turned up strongly. Getting rid of theaters just when television was striking was by no means pure loss.

As to the newly divorced circuits, they have done better than one might have expected. The theaters sold under the decrees have often been their worst earners, and their remaining large theaters have had more financial backing than most independents to install technical improvements like Cinemascope and stereophonic sound and thus to share in the recent box office gains from the popular pictures using these techniques. The Stanley Warner circuit owns Cinerama, and United Paramount Theaters has merged with American Broadcasting Company. Had Paramount Pictures and Theaters not been divorced, the Federal Communications Commission would hardly have allowed this new form of integration.

One respect in which the big producers have been hit is as treble damage defendants. Although many such suits are settled by giving the plaintiffs their legal fees and the right to a prior run whose denial had been the ground of their suit, the defendants have lost several and paid substantial claims. Pending suits demand damages of more than half

a billion dollars, exceeding the net worth of all defendants combined. Eventually the statute of limitations, the crystallizing of new distribution patterns, greater caution by the courts in the face of such a Pandora's box, and perhaps an industry arbitration system should dry up the flow of new suits.

Last comes the public. How has it fared as regards quality, price, and convenience? The government's hope was that, with bad pictures no longer floated by block booking, with majors forced to rent their features in an open market, and with all theaters available to show independent films, quality would improve. I asked an officer of an exhibitor trade association about this, and he replied: "The exhibitor is constitutionally unable to judge quality except by box office; why don't you ask the film critics?" So I asked, and heard from thirty-two who said that quality has improved, one who denied it, and the *New York Times* critic (incidentally, the most influential in the country) who told me courteously but plainly that quality is too complex a topic to discuss in that fashion. Three critics felt that the improvement which they observed could be credited to divorcement, twelve said no, and seventeen saw no clear connection. If, however, the decree was one factor which caused the big producers to cut down the number of their pictures and increase the time and money spent on each, it would seem that quality should have improved, and the decree thus get part of the credit.

Several of these factors might have been expected to put box office prices up: (1) higher distribution costs with the abolition of block booking; (2) harder bargaining by producers, who sometimes admit, or insist, that their terms on a particular picture can be met only if theaters raise their prices that week, but who avoid contractual resale price fixing such as the Supreme Court condemned in the Paramount decision; and (3) the tendency of some theaters, because they have stepped up their runs, to raise prices. If this third tendency went to its logical limit, neighborhood theater prices would rise, and downtown prices be forced down by slumping attendance as people could see early runs at home—thus presumably reducing the variety of price-and-product packages available to consumers. Although one may guess that these effects will be small, price statistics are not clear. The Bureau of Labor Statistics index of admission prices, hidden in the "Reading and recreation" component of its consumer price index, has increased 20 per cent since 1948, but industry estimates of the increase in the net price after deducting admissions tax range from the *Motion Picture Herald's* 11 per cent for 1954 to the *Film Daily Year Book's* 53 per cent for 1953. The fact that attendance has switched from smaller to larger theaters and also from daytime and weekdays to eve-

nings and holidays, plus the fact that an undetermined number of theaters, but probably most, made little or no cut in price when the excise tax was lowered last April, muddy the waters further.

Convenience has been improved for some members of the public, worsened for others. The reduction of unreasonable clearances has been good for all; but the 16 per cent of adult moviegoers who attend more than once a week may have felt the "product shortage." The old problem of too many theaters showing the same feature the same week has been intensified by the stepping up of runs, although other causes have operated—like co-ordination of showings with advertising campaigns and economies of buying a picture for all theaters in a circuit at once (technically, to be sure, on a "theater by theater" basis). How a picture may come and go, before the whole potential audience realizes it, is illustrated by the 200,000 people in the Chicago area who (according to a survey by a theater circuit) were still waiting for *Quo Vadis* to come to their suburban theaters long after it had been shown. Members of the public who are not bound by old habits, and are more anxious to see the newest thing, are better pleased. As I wrote this, five of the eight theaters in my immediate neighborhood were showing *Seven Brides for Seven Brothers,* and my daughter had managed happily to see it four times.

The morals I draw will be brief. (1) Vertical disintegration can, as would be expected, effectively remove the danger that integrated firms will abuse their power. (2) It may, however, boomerang on the supposed beneficiaries. Although the more ambitious exhibitors have won their chance to fight on equal terms with the big circuits, others would prefer the old days with their well-established grooves. (3) Disintegration may have mixed effects on the public—as, in this case, very likely better quality but possibly higher prices and perhaps more patrons convenienced than inconvenienced. (4) Antitrust decrees are likely to have less influence on an industry than either competition of other commodities and services or shifts in population and consumer habits, of which television and the drive-in, respectively, are the prime examples here.

On net balance, this experiment in disintegration is not without its hopeful aspects, but its results to date are better characterized as disappointing than as clear or important.

THE DECLINE OF MONOPOLY IN THE METAL CONTAINER INDUSTRY

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I

The Clayton Antitrust Act is now over forty years old, and economists are still uncertain about its role in antitrust policy. Most would doubtless agree on the need for some instrument that is more flexible than the Sherman Act. That Act cannot be applied until monopoly control is well established, and one purpose of the Clayton Act has always been to prevent monopoly by arresting it in an incipient stage. Its success in this respect has been mixed; many persons have pointed out of late that a policy of prohibiting competitive practices that could eventually result in monopoly may be leading us toward per se rules of business conduct that are impossibly confining. But the Clayton Act has also been used against business practices in markets that already have a monopolistic structure. Sometimes this has been done merely to provide a bill of particulars in cases tried chiefly under the Sherman Act; but sometimes it has been done in an attempt to weaken monopoly through an attack on its manifestations. Doubts have also centered on the wisdom of this latter policy, on the ground that it does very little good to prohibit a market practice if the underlying monopoly power which makes it oppressive remains untouched.

The American Can case of 1950 illustrates in almost unexpected circumstances the force that the indirect and peripheral approach of the Clayton Act may have to make competition more effective. This was a case in which a specific market practice was the key to market power. The practice had nothing to do with the creation of market power, since it supervened upon a monopolistic structure that was already there; but it played a decisive part in the maintenance of market control after the foundations of monopoly had been undermined.

A cursory examination of the structure of the metal container industry just before the antitrust suit began in 1948 might well have made anyone skeptical of the success of a policy which did not involve fundamental structural reorganization. The industry was highly concentrated, and still is: the two leading firms, American Can Company and Continental Can Company, together accounted for nearly 80 per cent of total sales, and American alone had over 45 per cent.[1] There were in

[1] *United States of America* v. *American Can Company*, Civil Action No 26345-H. In the United States District Court for the Northern District of California, Southern Division Exhibits UU and 3124 (Stipulation on Statistics, March 31, 1949).

addition a number of small sellers—no one of them more than one-eighth as large as American—which occupied sheltered and specialized positions or else appeared to subsist on a margin of tolerance. The major companies manufacture a product-mix of containers for different purposes, but differentiation within each product line was and is insignificant. Cross-elasticities of demand between metal cans and substitute containers are very small. The prices of the two leaders, as well as their other market policies, have long been substantially identical. Prices for given products in given sales regions were set by one of the large firms, the other following; a policy of universal freight equalization eliminated the uncertainties of geographical differentiation; and prices exhibited the characteristic rigidity that we have come to associate with tacit oligopolistic collusion.

Tacit collusion in circumstances like these might be expected to result in the maximization of joint profits. However, the maximization of joint profits is always subject to limitations in any oligopoly structure, and in some instances the limitations are so severe that the principle loses its explanatory value. Economists have long preferred an eclectic approach to this problem. No universal solvent has yet been found that will exempt us from a detailed examination of the structure of particular oligopolistic markets and their history, as a prerequisite to explaining their behavior. The limitations upon monopoly power are often hidden from immediate view. A detailed analysis of the metal container industry reveals a number of them.

II

There is time for only a brief summary here. The first thing to be noted is that the limited-duopoly structure in the can industry is a relatively recent development. Twenty years ago any industrial economist would have classed the industry with those dominated by a single firm. American Can was organized originally as a trust controlling virtually the entire capacity of the industry. It suffered the fate of many of the trusts organized at the turn of the century: the umbrella it held over the industry encouraged the growth of competition, and within a dozen years its share of the market had fallen to 50 per cent. It was about this time, in 1916, that American was first charged with monopoly under the Sherman Act. Professor Hession in his able study of the food container industry (*Competition in the Metal Food Container Industry, 1916-1946* [Brooklyn, 1948]) calls American Can "the trust that wasn't busted." The court refrained from dissolving it principally because of the rapid decline in its market share, and the judge expressed the hope that the growth of rivals would soon restore competition in the industry.

Competition was not quickly restored. American possessed nothing approaching pure monopoly after 1916, but it remained the dominant firm. Its market share ceased to fall, and its capacity remained for a time enormously greater than its rivals'. American's prices determined the prices for the whole industry. It maintained its lead by rapid development and expansion from within. Nevertheless, its power to control the industry was considerably weaker in 1948 than it was in 1916.

This slow metamorphosis was due partly to developments within the industry, partly to the impact of the antitrust laws. The structure of the industry altered gradually as Continental Can began to challenge American's leadership. In 1916, Continental was a small cloud on American's horizon, hardly distinguishable from a number of other small rivals. Throughout the following decades, Continental grew rapidly with a bold program of acquisition and merger as well as by rapid expansion from within. By 1939, it was half as large as American; by 1950 it was three-fourths as large. Its growth eventually put it in a position that rivalled American's. Prior to the middle thirties, American was the only metal container manufacturer with an important research program and was practically solely responsible for the progress and development that had occurred up to that time. Moreover, it was the only manufacturer up to then that was fully able to realize certain other advantages of scale. These are not production economies, but are achieved through the interlocking of separate plants so that the extreme uncertainties of demand for food containers in any one area are diffused along a chain of production sites. The ability of American to offer certainty of supply, together with its facilities for research and customer service, made it the only acceptable source of supply to many buyers of cans, including most of the large and stable ones, until a second large seller appeared.

By the end of the thirties, American was at last confronted with a powerful, efficient, and progressive rival in practically every geographical region and every product, including many in which American had earlier enjoyed a monopoly. It took time for Continental to break into the geographical strongholds of American and to build up an effective and experienced research staff, but in the end the supremacy of American was undermined.

Conditions were more stringent for the smaller firms. No other was able to achieve anything like the growth of Continental; in fact, several of those which had begun to grow to substantial size were acquired by Continental. A few producers of food cans managed to build up integrated regional organizations, securing at least part of the advantages of size, and compensated for their inferior research and service facilities

by charging somewhat lower prices. Two firms even succeeded in entering the industry and establishing themselves in the food can market. All of these smaller producers were potential bases for expanded competition; that this potential was not fully realized was due to certain market practices of the larger firms which held the smaller ones in check.

A significant change was forced by the tightening of the law against price discrimination after 1936. The Robinson-Patman Act affected two markets: tin plate and tin cans. Tin plate accounts for 60 per cent of metal container costs. In the days of the Steel Trust and the Can Trust the tin plate market was almost a classic bilateral monopoly. The monopolies on both sides lost their near-exclusive control, but the "leading bargain" between U. S. Steel and American Can continued to determine the price of tin plate. In this market it appeared that monopoly power was offset by monopoly power. The benefits of this countervailing power, however, were mixed. Improvement and development in the tin plate industry, for instance, have been rapid and considerable, and there is no doubt that the large buyers, especially American, have pressed the steel producers closer to the maximum attainable rate of progress—both in product improvement and cost reduction—than would have been the case if buyers had been small and impotent. On the other hand, the price benefits of countervailing power filtered down to consumers very slowly; it requires a substantial degree of competition in subsequent markets before countervailing power in a prior market amounts to anything more than a division of spoils. One result of American's dominant position as a buyer of tin plate in the early years was that the tin plate producers favored it with secret rebates and systematic price discrimination. After a second buyer of substantial size had entered the market a new dimension of strategy emerged, and price reductions negotiated between individual buyers and sellers became more difficult to confine to the largest buyers. Nevertheless, systematic discrimination continued in various forms up to the passage of the Robinson-Patman Act, at which time American actually capitalized its claims to discriminatory treatment and liquidated them by accepting substantial lump-sum settlements from United States Steel and other suppliers. After 1937, countervailing power was exercised in behalf of all buyers of tin plate. This benefited the ultimate buyers of cans only insofar as there were limits to the exercise of monopoly power in the can market.

The buyers of cans were themselves not entirely helpless, though none had anything like the bargaining power that American had in the tin plate market. Even in the days when there was only one large

can manufacturer, the big canning companies had the option of manufacturing for themselves. Backward integration is not extremely difficult for a large user, and it would have taken only a slight widening of the profit margin on cans to make it economical. Potential entry from the buying side limited monopoly power on the selling side. At first the result was systematic, secret discrimination in favor of the buyers who could offer this threat. After a second seller grew to large size, the bargaining position of the large buyers was strengthened, since they could play one off against the other. The Robinson-Patman Act obliged the major can companies to abandon secret discrimination. It was replaced, not by uniform prices to all buyers, but by an open schedule of volume discounts, which eventually came to be based on total purchases of all kinds of containers from the supplier. The discounts were greater for large-volume purchasers than any concession that the smaller can companies could easily offer, and there is no doubt that these discounts worked to their disadvantage. On the other hand, the continuous alteration and reshaping of the discount structure did afford a means of limited price competition between the two leaders; and the large buyers had at least the potential power to enforce this competition between them.

III

Though the monopoly power once possessed by the dominant firm had been markedly eroded by 1950, the effect of the underlying structural changes on competition remained more potential than actual. The reason was that the leading firm followed several policies which concentrated its remaining market power in the most effective way, and its large rival did likewise. There were three important instruments of commercial dominance. The first was the volume discounts just mentioned. The second was the practice of selling under long-term requirements contracts. It is fair to say that neither of these could have had a powerful enough effect to justify action under the antitrust laws, though they did tend to reinforce each other. The contracts were written for specific containers for use at specific plants. Smaller can companies occasionally succeeded in becoming secondary suppliers of large buyers, but it was the usual practice for a buyer to concentrate all his purchases on a single source of supply. There were some buyers whose purchases considerably exceeded the volume necessary to get the highest discount that was offered, but most of these also had long-term requirements contracts with a single supplier or, less frequently, split their purchases between American and Continental. The amount of business that the smaller can companies were eligible to compete for at any given time

was thus restricted. Volume discounts were partly responsible, but the superiority of the two large sellers in research and customer service may have been equally important in determining the result.

The third instrument of control was the practice of tying the lease of can closing machinery to the sale of cans. (This was not done through an explicit tying clause, but by arranging the expiration dates of separate contracts so that no canner would be able to retain American's machinery to close competitors' cans. There were minor exceptions.) This requires a word of explanation. If the manufacture of closing machinery had been perfectly competitive, the larger can companies would have gained no net advantage by this practice. But American's can machinery has long been recognized as the best and most complete in the industry, and its progressiveness in this field is beyond dispute. Continental began late, but was overtaking American rapidly in the late thirties. Both large firms followed the same policy. Rentals on closing machinery, which also covered servicing by the manufacturer, were set below actual cost, to induce buyers to lease machines. Most can buyers were allowed to retain the machinery only as long as they purchased the cans to be closed on it from the same firm. The moderate advantage which the major sellers possessed in closing machinery was thus extended forward and magnified in the can market. The relation between supplier and customer became harder to break. (Closing machinery is generally unimportant for nonfood cans, and both major companies faced much more vigorous competition from independents in this field.) In markets for food cans, the smaller manufacturers were forced to imitate the leasing practices of the majors; but since they had to buy somewhat inferior closing machines on the open market and lease them at below-cost rentals, they reaped no comparable advantage. (One or two of the smaller companies also entered the manufacture of closing machinery, without much success until recently.) A side effect of the practice was that no canner would buy machinery in preference to renting it, and independent machinery manufacturers faced an uneconomically thin market.

IV

The government might have attempted a major Sherman Act case, with wholesale dissolution and structural reorganization of the industry as the objective. But this would have been risky, since the specific charge of monopolization had been tried in an earlier case and the judge had refused the suggested remedy of dissolution. Instead, the government attacked the practice of tie-in sales directly under Section 3 of the Clayton Act, retaining a Sherman Act charge to scoop in the requirements contracts if possible and to provide for equitable relief.

There is some evidence that the Antitrust Division was not entirely satisfied with the form that its case eventually took in consequence, but it won the case nevertheless. The court decided that American had violated both the Clayton Act and the Sherman Act.[2] In addition to a number of minor matters, which need not concern us here, the 1950 decree altered market practice in the metal container industry in three ways. (Continental accepted the same judgment in a consent decree.)

1. The major firms were prohibited from offering any annual cumulative volume discounts.

2. Requirements contracts were limited to one year. American Can had presented convincing evidence that requirements contracts are necessary to protect food canners, in view of the great uncertainty of crop yields and timing, and that canners preferred them to fixed-quantity contracts; hence the court did not prohibit them altogether. The court also ordered that separate contracts be written for individual plants when the customer had more than one cannery. The buyer could still place all his contracts with a single seller if he chose, but smaller can manufacturers would find it easier to bid at least for the business of a single plant of a multiplant buyer.

3. The tie between machine leasing and the sale of cans was broken. The major companies were permanently enjoined from conditioning the lease of machines on the sale of cans, by any subterfuge. In addition, they were ordered to sell their existing closing machines at bargain prices to anyone who wanted to buy them, giving priority to existing lessees. This order applied to all machines to be built in the future as well, for a period of ten years. The can companies were required to make all technological information and know-how available to buyers, to set up schools to train service men employed by the canneries, and to license closing-machinery patents without royalty. The court recognized that there were certain advantages to integration between machinery manufacture and can manufacture, since can manufacture and can closing involve much the same technology, and so it did not order divestiture. The can companies were required to lease to everyone any machine that they were then leasing to anyone. Moreover, rentals had to be fully compensatory, including a fair profit, after the end of 1953. (Continental has asked for a postponement. Fully compensatory rentals on its diminished stock of equipment would be prohibitive, it claims, since overhead has not been proportionally reduced.) No more could below-cost rentals be used as an inducement to lease.

[2] 87 F. Supp. 18 (1949). A simultaneous case against Continental was not brought to trial, Continental having agreed in advance to accept any judgment entered against American, short of divestiture.

V

This decree knocked out practically all the remaining props of market control. The decree has been in effect now for over three years. Some of its consequences have been striking. One instance is the sale of closing machines, which has greatly exceeded everyone's expectations. The can manufacturers had claimed that customers would be reluctant to buy them—that customers would prefer to lease instead and pay the supplier the appropriate fee for bearing the risk of obsolescence and the task of servicing and maintenance. If this reluctance ever existed it was quickly overcome. The bargain prices the court set on the machines existing in 1950 made it uneconomical not to buy them, and in addition American and Continental, in wholehearted compliance with the letter and the spirit of the decree, have made vigorous efforts to sell both old and newly manufactured machines. By the middle of 1954 both American and Continental had sold over 75 per cent of the closing machines they were leasing in 1950. While the lease market may revive in the future, can buyers are no longer heavily dependent on their can suppliers for closing machinery, and there is no way now for the machinery supplier to apply commercial leverage to the can market. After the transition period is over, the independent manufacturers of machinery will be able to market closing machines directly to the canning industry, and they have already responded to this broadening of their opportunities.

A second result has been an extensive breakdown of exclusive supplier-customer relations. While fruit and vegetable canneries have largely continued their requirements contracts, the large packers operating several canneries have begun to allocate them to different suppliers. Other canners have begun to split requirements within the plant, closing cans from several suppliers indiscriminately on the machines of several manufacturers. There has been an enormous growth in open-order purchasing at the expense of contract purchasing. Small firms are now better able to detach fragments of business which used to be held firmly by the large can suppliers. They can enter large-volume markets either by carrying off supply contracts for individual canneries in a chain or by becoming secondary sources of supply within the plant. The vertical partitions in the market which formerly made the ties between particular buyers and sellers very strong have been demolished, and competitive forces, wherever they originate, can sweep across it largely unimpeded. The market position of smaller manufacturers has been greatly strengthened.

It is interesting to note that these changes in the can market have been accompanied by some instability in the tin plate market. At least part of this instability has been transmitted backward from the

can market. Prices have become more flexible; open-order purchasing has grown in volume; the leadership of the leading bargain between U. S. Steel and American Can has weakened further. The tin plate suppliers still feel the weight of the large buyers' bargaining power, but this is more likely now to work to the benefit of ultimate consumers of cans.

It is possible of course to expect too much of the decree. The gross structure of the industry has not changed very much and probably will not change much in the immediate future. Doubtless the effects of a decree of dissolution, if American had been convicted of illegal acquisition and maintenance of monopoly, would have been more spectacular. Several firms could have been fashioned out of either of the leaders without an appreciable loss of efficiency, and the market would in time have enforced a high degree of competition among the fragments. However, such a monopoly charge could not have been sustained. We must decide whether we have any better ground now than the court did in 1916 for expecting workable competition in the future.

American and Continental together would still be able to dominate the industry in the short run if they maintained effective collusion in every dimension of the market. But instead the two large firms are in a state of intense rivalry. The challenger is staging a vigorous drive on the markets of the leader. A number of large accounts previously held by American have now been split. Technological rivalry is unrestrained. While open price warfare has been avoided, except in a few local instances, there is protracted maneuvering in an atmosphere of great uncertainty when the time for quoting new prices and renewing contracts comes round every year. American's price leadership is now merely barometric, and it cannot count on being followed by Continental or by any other seller.

The smaller firms, aided by a strong growth trend in the industry, have been establishing themselves on a more secure footing and have also been edging into the markets of both the leaders. In several instances recently the price structure of the majors has had to be adapted to the independent competitive tactics of a smaller firm aggressively reaching for a larger share. Although the oligopoly structure remains, enough has been said to show that the competitive pattern is in a state of flux.

No outsiders have entered can manufacture in the last three years, but the threat of entry from the buying side has been intensified. Large buyers can no longer be pacified with volume discounts. During the past year the very largest consumer of packers cans began to manufacture part of its own requirements, and another large buyer, located in one of American's few remaining monopoly territories, has announced

plans to manufacture all its own containers. The effect of these events is incalculable. Both of the large sellers are constrained as never before by the threat of backward integration, and the restraints exercised on profit margins in cans work to the benefit of all buyers.

American itself has no monopoly weapons left in its hands. Any firm which relies on size and the momentum of past achievements alone to protect it against competition is likely to find its position deteriorating with alarming speed. What American can do is to take advantage of the moderate superiorities it evidently has in efficiency and research. It can maintain its leading position by reducing costs and continuing its rapid rate of product development, passing along the benefits to consumers. Its large rival will push it, or perhaps lead it, in this respect. Its smaller rivals will offer a stronger competitive challenge as time goes on. And its large customers will never be more than a few years behind in potential efficiency if they should decide to produce their own supplies. A forecast of workable competition appears to be justified. Thus it seems that the Antitrust Division, in choosing to make a limited attack on market practices—however much it may later have doubted its own wisdom—made a good decision after all.

THE BASING POINT DECISIONS AND THE STEEL INDUSTRY

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Until a few years ago, the basing point system was used in a number of important American industries, including the iron and steel industry, the cement industry, the corn wet milling industry and others. Several Federal Trade Commission (FTC) orders, some adjudicated and some not, have put an end to the system; the key case was undoubtedly the one against the cement industry, on which the Supreme Court ruled in 1948. The purpose of this paper is to examine the effect of these decisions, with particular reference to whether they will significantly increase price competition in the former basing point industries.

The first step will be to discuss some of the rulings of the FTC and the courts and to assess their impact on the basing point system and their general economic significance where appropriate. The next step is to determine if possible whether the rulings will produce a greater degree of price competition in the former basing point industries. The discussion will be particularized for the iron and steel industry, which until 1948 used a multiple basing point system. The final few paragraphs will be a description and brief analysis of events in the steel industry since the end of the basing point system.

The term "basing point system" will frequently be used without qualification, even though the system has taken several forms. Sometimes the context will make clear what form is referred to. More often, the reference is intentionally generic; i.e., to a method of pricing which regardless of variations in detail permits only delivered pricing, and makes the price to a buyer the lowest combination of basing point price and outbound rail freight charges, regardless of the actual location of the seller and regardless of the form of transportation actually used.

I

Beginning in 1937, after years of inactivity in this field, the Federal Trade Commission issued a number of complaints against firms and industries using the basing point system. The Commission challenged single basing point systems used by the Corn Products Refining Company and the A. E. Staley Manufacturing Company and multiple basing point systems used in the cement, rigid steel conduit, iron and steel and corn wet milling industries. Three other complaints against the Morton Salt Company, Samuel H. Moss, Inc., and the Standard Oil Company (Indiana), though not concerned with basing point pric-

ing, produced applicable interpretations of the Robinson-Patman Act. All of these complaints except two have been adjudicated; the corn wet milling order was accepted by the industry and the steel order was negotiated between the parties.

It is not necessary for present purposes to discuss these cases one by one; a short and unfortunately rather dogmatic summary should suffice. It will be convenient to divide this summary into two parts, corresponding to the two laws upon which the Commission has relied: the Federal Trade Commission Act and the Clayton Act as amended by the Robinson-Patman Act.

The Federal Trade Commission Act declares unlawful "unfair methods of competition in commerce, and unfair or deceptive acts or practices in commerce. . . ." The Commission has used this act to attack basing point systems as combinations, conspiracies, or planned common courses of action. Recent adjudication has established the following:

1. *A basing point system used pursuant to a combination or conspiracy is an unfair method of competition.* This conclusion would seem so obvious as to require no justification. Notwithstanding, respondents in the Cement case challenged the jurisdiction of the Commission, on the grounds that the combination of which they were accused was an offense under the Sherman Act, against which the Commission could not proceed. The Supreme Court ruled that the Commission had jurisdiction under the Federal Trade Commission Act even if the offense also violated the Sherman Act. The Court added that individual or concerted conduct falling short of a Sherman Act violation could still violate the Federal Trade Commission Act.

2. *A combination or conspiracy need not be proved by direct evidence; it may be proved by circumstantial evidence, including evidence of market behavior.* Ruling in the Cement case, the Supreme Court stated that the Commission was authorized "to find understanding, express or implied," from evidence that the industry's institute worked to maintain the multiple basing point system, that the pricing system produced uniform (sic) prices, and that respondents followed the system. The Seventh Circuit Court of Appeals in the Rigid Steel Conduit case stated that an agreement could be shown by circumstantial evidence, including evidence of price conformity and of the existence of a plan which equalized delivered prices. These decisions give to economic tests a substantial place in determining desirability and legality. They also open the door to orders which can strike not only at written agreements but also at the economic acts which agreement may have been designed to perpetrate.

3. *Although not clearly established, it is possible that basing point*

systems are illegal per se. The FTC complaint in the Rigid Steel Conduit case was divided into two counts, each alleging a violation of the Federal Trade Commission Act. The first charged the existence of a conspiracy, effected by use of the basing point system. The second, however, did not charge combination, conspiracy or unlawful discrimination. Instead, it charged that the sellers individually violated the Federal Trade Commission Act "through their concurrent use of a formula method of making delivered price quotations with the knowledge that each did likewise. . . ." The cease and desist order included prohibitions based on both counts and was upheld by the Circuit Court. The Supreme Court, by a vote of 4-4, refused to overrule.

The impact of this case on basing point pricing is still not clear. On the one hand, the Commission brief before the Circuit Court stated that Count 2 was "frankly directed against the basing point practice as being, *per se*, an unfair method of competition. . . ." On the other hand, members and employees of the Commission later denied that basing point systems were under attack as such and argued that the Conduit case was basically a conspiracy case. The statement in the brief probably reflects the Commission's true intent; it is significant that the later statements followed anguished howls from the business community and the start of hearings by a Congressional committee.

The Clayton Act as amended states "that it shall be unlawful . . . to discriminate in price . . . where the effect of such discrimination may be to substantially lessen competition or tend to create a monopoly. . . ." Certain price differences, however, are exempted. The exception for lower prices "made in good faith to meet an equally low price of a competitor" is the only one relevant to a basing point situation.

In order for a basing point system to be found unlawful under the Clayton Act, it must be established that (1) it leads to discrimination in price, (2) the discrimination may lessen competition, and (3) the discrimination is not justified in one of the ways provided by law. Adjudicated cases seem to establish the following on these points:

1. *A discrimination is merely a difference in price.* The Supreme Court ruled in the Morton Salt case that the Federal Trade Commission, to establish a discrimination in price, had only to show that a seller had charged one purchaser a higher price for like goods than another purchaser. The legality or illegality of the discrimination would depend on whether the seller positively justified it in a way provided by law and on whether it had an adverse effect on competition.

2. *In a basing point situation, price is not the delivered price paid by purchasers, but the mill net realized by sellers.* In all of its basing point complaints, the FTC has considered price to be the seller's mill net, defined as delivered price less the cost of transportation from

seller's plant to place of delivery. Under this definition the basing point system necessarily produces discrimination, because sellers regularly absorb freight on some sales. Producers located at basing point have objected vigorously to this concept. They argue that delivered prices on freight absorption sales are the same as those charged by the mills whose prices are being met; hence, there can be no question of unlawful discrimination.

This argument is neither convincing nor necessary, the latter because freight absorption can be justified on other grounds. Any firm selling on a delivered basis will of necessity discriminate in price, unless its customers are located at a common point. However, its price differences are legal when they correspond to differences in the cost of delivery; they are also without fault economically as long as the cheapest forms of transport are used. If not, then *ceteris paribus* there is a misallocation of resources. If, however, a firm absorbs freight, its differences in delivered price no longer correspond to differences in the cost of delivery, and may be illegal no matter how price is defined. Its discriminations are suspect from an economic point of view because they lead to a possible misallocation of resources.

3. *It is not necessary to find that a price discrimination has injured competition, but only a reasonable possibility that it may.* Price differences constitute discrimination, but not all discriminations are unlawful; to be unlawful, a price discrimination must be injurious to competition. The Supreme Court, in both the Corn Products case and the Morton Salt case, held that it was not necessary to find actual injury to competition but only a "reasonable possibility" that it might occur. The Court went even further in the Morton Salt case, when it ruled that the Robinson-Patman Act justified a finding of injury to competition by showing "injury to the competitor victimized by the discrimination."

Some lawyers fear that an irresponsible Commission, freely interpreting the doctrine of reasonable possibility, will initiate complaints based only on a remote potentiality. But the Commission, in its 1948 statement of policy, denied any intention of doing so; the courts, in any event, would undoubtedly not permit it. On the positive side, the doctrine of reasonable possibility simplifies proof and permits the prohibition of practices which to an economist are clearly a danger to competition but which in the past have not met the rather legalistic tests of the courts.

The ruling which equates injury to competition with injury to a competitor is the really controversial one. Given pure competition as a standard, there is no place for price discrimination; since discrimination is a sign of monopoly, and monopoly and competition are mutually exclusive, the elimination of discrimination must perforce promote com-

petition. When the attainable and hence the standard is something other than pure competition, the answer is not so simple. It is still true, of course, that discrimination is the product of monopoly power. It is no longer true, however, that discrimination is necessarily anticompetitive. In a market where small numbers makes possible control over prices, as in the typical basing point industry, price discrimination has been a powerful competitive force when it actually undercuts rivals' prices.

It is in precisely these industries, however, that any competition in price, including price discrimination, will immediately and substantially affect a competitor. Hence, the two cannot be equated unless one is willing to give up competition altogether.

4. *The good faith defense of section 2b of the Robinson-Patman Act is an absolute defense to a charge of price discrimination, but probably not in a basing point situation.* The FTC ruled in the Standard Oil case that the good faith defense was procedural rather than substantive. As such, it was ruled not admissible if the Commission affirmatively showed injury to competition. The Supreme Court disagreed, stating that "we find no reason to destroy the defense indirectly, merely because it also appears that the beneficiaries of the seller's price reductions may derive a competitive advantage from them or may, in a natural course of events, reduce their own resale price to their customers."

It is doubtful, however, that the Court would have ruled the same way in a basing point case. In the Staley case, the company argued that it had adopted its single basing point system in good faith to meet the competition of the Corn Products Refining Company. The Court held that section 2b "does not concern itself with pricing systems or even with all the seller's discriminatory prices to buyers. It speaks only of the sellers' lower price. . . ." In its Cement decision, the Supreme Court cited the Corn Products decision and this portion of the Staley decision, and concluded that "the combined effect of the two cases was to forbid the adoption for sales purposes of any basing point system."

These statements have been disconcerting to sellers in the basing point industries. Basing point pricing involves the regular meeting of competitors' prices. The alternative is either to meet competition on an individual basis or not to meet it at all. If a seller meets it on an individual basis, he must still know how frequently and comprehensively he can do so without becoming systematic in the eyes of the law. As an executive of the United States Steel Corporation once put it, to attempt to handle 3,000 orders per day and to meet competition without following what appeared to be a systematic method was commercially impractical.

II

The FTC and the courts have clearly dealt a fatal blow to the basing point system. Adjudicated cease and desist orders have eliminated exclusive delivered pricing, the exclusive use of rail rates in the calculation of delivered prices, the industry-wide preparation and dissemination of freight rate books, and the plant which fails to quote a base price. The orders have probably also eliminated the systematic, routine meeting of competitors' prices, but probably not the individual noncollusive absorption of freight.

The important question is whether the decisions will lead to a greater degree of price competition in the industries which have used the basing point system. Views on this subject, though many and varied, tend to cluster around two poles. One general view is that the basing point system is an essential ingredient of combinations and conspiracies, which could only with difficulty be carried on without it, if at all. Hence, its elimination is per se a decisive step in promoting price competition. Some holders of this view go a step further by advocating the complete elimination of freight absorption, even if practiced individually. The other general view is that the basing point system developed quite logically and more or less inevitably from certain market characteristics, and that something like the basing point system is certain to be found in industries having these characteristics. Hence, the elimination of the basing point system insures neither a radically different method of pricing nor a markedly greater degree of price competition. These views may be called for convenience the collusive and the oligopolistic.

Since the industries which have used the basing point system have many characteristics in common, it is tempting to pursue this argument in general terms and to make what is said apply to all of them. There is the very practical objection, however, that no one person, or at least not this person, can speak with such broad authority. Moreover, significant differences among these industries do exist. Therefore the ensuing discussion will be restricted to the iron and steel industry. It may be suggested, however, that the discussion is at least broadly applicable to all the industries which have used the basing point system.

We start with the proposition that the nature and degree of price competition in an industry depends on the presence of various market characteristics or elements and the combination in which they occur. The conceptual schemes of price theory consider only a few of these elements, particularly the number of sellers and the nature of the product. The number affecting price behavior in the steel market and in other industrial markets is much greater. However, limitations of time and space will permit consideration of only a few here, which are fortunately rather decisive.

Steel sales are typically made directly by producer to consumer, without the intervention of a central market or other middleman. The steel market is characterized by the following: (1) A relatively small number of large sellers. On January 1, 1954, nineteen large integrated firms accounted for some 93 per cent of the industry's blast furnace capacity and some 90 per cent of its steel ingot capacity. The United States Steel Corporation alone accounted for 34 and 31 per cent, respectively. (2) A standardized product. Steel products are made to specification; hence, competition centers around price rather than around differences in quality, real or imagined. (3) Substantial fixed costs and a high ratio of fixed to marginal cost. (4) Freight costs high enough in proportion to sales price to be decisive in the selection of a seller. (5) A low price elasticity of composite demand but a high price elasticity of demand for the products of a single seller. (6) A significant difference between the location of capacity and the location of demand. These characteristics, with particular reference to the first two, are typical of pure oligopolies.

In the absence of collusion, what kind of price competition will result in a market with these characteristics? In the first instance, each seller would presumably name a plant price (we beg the question of what determines its level) and offer it to all comers. Buyers would purchase from a particular seller, however, only if his price was equal to or lower than the prices of cempeting sellers, taking into account the cost of outbound transportation. Hence, any given seller could do business only in his freight advantage territory; i.e., where the sum of his plant price and outbound freight costs was at least as low as that of his rivals.

Not all sellers—and possibly not any—would be satisfied to stop here. Lack of correspondence between capacity and demand, changes associated with the business cycle, changes in the pattern of demand, etc., would leave some sellers with unused capacity and a desire to increase their sales. They could do so, however, only by selling outside their freight advantage territories at delivered prices at least as low as those of their competitors; i.e., by absorbing freight and accepting lower mill nets. However, it is profitable for them to do so as long as they more than cover marginal costs, if the alternative is not to make the sale at all. There is no reason, however, for making these same concessions to buyers located within their freight advantage territories, except to meet the price cuts of a competitor. In short, there is an incentive to discriminate in price.

If sellers ignore the possible reactions of their rivals, they will act as if the elasticity of composite demand is the same as their individual elasticities of demand. That is, they will beat rather than meet competi-

tors' prices outside their freight advantage territories. To meet a price is to be less than certain that a sale will be made; to beat a price is to be absolutely certain. The difficulty, of course, is that all sellers, following the same process of reasoning, pursue the same course of action; those who suffer from price cuts retaliate. Since the price elasticity of composite demand is low, each seller experiences only a slight increase in demand and suffers an actual loss in net revenue. If each seller continues his price cutting in an attempt to recoup, the result will be cutthroat competition and prices will be driven to the level of marginal cost.

It may be argued that this description is a fanciful one, not related to anything that now happens in real life. And of course this is so, for oligopolistic sellers in real life are quite aware of their interdependence. However, the steel industry in the nineteenth century was frequently subject to cutthroat competition, and more recent episodes, particularly in the years 1911, 1921, and 1938, have brought cutthroat competition perilously close to reality. This history strongly suggests that unrestrained competition, if it occurred, would be cutthroat competition.

Bitter experience, then, if nothing else, teaches steel sellers that what one can do with profit cannot be done by all simultaneously. Hence it becomes in the common interest to avoid unrestrained competition or any competition which puts undue pressure on prices. Given this attitude and given the market characteristics of the steel industry, it is not unreasonable to suppose that a pricing system like the basing point system would develop. Sellers at a location with one or more rivals would charge their plant price plus outbound freight up to a point where a competitor's price similarly calculated was lower; then they would meet the lower price but not beat it. Isolated sellers might find no reason to quote a base price; if not, they would simply meet competitors' prices at every point of delivery. Thus would develop the familiar outlines of the basing point system with its dichotomy between base and nonbase mills.

What purpose does the basing point system serve in this context? The problem is to keep freight absorption from starting an unprofitable chain of price cuts and retaliations. This can be done if sellers follow a policy of meeting rather than beating competitors' prices outside their freight advantage territories. The basing point system makes it easy for such a policy to be carried out, for it tells each seller what every other seller will charge at every point of delivery. In effect, it eliminates the uncertainty which oligopolistic sellers normally have about their rivals' prices. One must distinguish, however, between pricing policy on the one hand and the mechanism for carrying it out on the other hand; the two are not the same. The policy, in this case, is to

meet rather than beat competitors' prices; the mechanism for carrying it out is the basing point system. The basing point system will do the things claimed for it here only if a desire to follow the policy exists in the first place. In other words, there is nothing in the basing point system which prevents the undercutting of rivals' prices if sellers choose to do it. Conversely, the policy of meeting rather than beating competitors' prices can be carried on without a basing point system, though with considerably greater difficulty. By the same process of reasoning, the basing point system does not cause discrimination; it merely keeps discrimination within certain bounds. It follows that the mere elimination of the basing point system does not remove the incentives which produced it and does not automatically lead to a radically different pricing policy.

The basing point system, in this view, has two indispensable elements: exclusive delivered pricing and a common method for calculating delivered prices. If f.o.b. sales are permitted or if delivered prices are calculated in different ways, sellers cannot know in advance the exact prices they have to meet, and the system fails to serve the purpose for which it was adopted. Freight absorption is an indispensable element in another sense, for if it is not permitted, the need for a basing point system disappears.

Those who adhere to the collusive view of the basing point system reject this line of reasoning, on one or more of three grounds. First, they argue that the foregoing description implies development of the basing point system through natural evolution, without the intervention of human will or volition. They then easily show that natural evolution could not possibly account for such a complicated and detailed method of pricing. Second, they assign quite a different role to small numbers. Fewness of sellers is considered important because it facilitates collusive agreements to use the basing point system, and not for the reasons accepted here. Third, they argue that a satisfactory degree of price competition can be secured in the former basing point industries through use of the uniform f.o.b. mill pricing system. Each of these points will be considered in turn.

The theory of natural evolution is indeed easy to demolish, for it is only a straw man. Those who adhere to the oligopolistic view do not claim that the basing point system came about automatically and impersonally. They claim only that it was not an artificial imposition, since the market characteristics of the steel industry and certain other industries make the emergence of a pricing system like the basing point system highly probable. Human intervention in the actual development of the system is not precluded.

Whether basing point systems are collusive devices is a question of

fact. The Supreme Court in the Cement case said: "We think that adequate findings of combination were made and that the findings have support in the evidence." The Seventh Circuit Court ruled similarly in the Ridgid Steel Conduit case. Users of the basing point system, however, have vigorously dissented. It is not necessary to decide here whether the courts were right or wrong. For, from the point of view of public policy, the real question is not whether there has or has not been collusion, but whether the mere elimination of collusion, if it exists, will produce a substantially different form of rivalry.

The foregoing analysis suggests that it will not, particularly if one's standard is near to the purely competitive. The incentive to discriminate and the further incentive to keep discrimination within certain bounds exist independently of any possible collusion and would continue to exist after it was ended. The basing point system, in short, only expresses and formalizes a type of price behavior which arises for reasons other than collusion. This is not to suggest that collusion is to be countenanced; it is only to suggest that its elimination, if it exists, would not be decisive. To change pricing policy in a way which makes sense economically one must change the market conditions which produced it.

The uniform f.o.b. pricing system requires that a seller receive the same mill nets on all sales; freight absorption is excluded. Therefore, each seller has a local monopoly in his freight advantage territory, which he can enlarge only by lowering his mill price. Proponents of this pricing method expect that it will lead to a substantially greater degree of price competition, because sellers are provided with a compelling incentive for reducing their plant prices; i.e., the expansion of sales territories in which they can have no rivals.

This reasoning ignores the realities of pricing under oligopoly; it erroneously assumes a one-to-one relationship between an incentive to cut prices and actual price cuts. The true situation would seem to be as follows: If business at the geographic margin is substantial, there is an incentive to cut prices to get it. However, the returns from this added business must be balanced against the lower returns on sales which could be made without a price cut. If the marginal sales are still worth making, then they are by the same token too lucrative to lose, and a price cut would probably be met. Other sellers might meet a price cut even if the marginal business was not lucrative, in order to prevent their customers from being placed at a disadvantage in competition with the customers of the price cutter. If for either reason a price cut is met, all sellers are worse off than before, including the original price cutter. The practical result is that price cuts are not made. As soon as a mutually satisfactory pattern of f.o.b. prices has been established, it tends to remain unchanged; a *de facto* market sharing agreement de-

velops. The likelihood of price cuts is therefore even less than under the basing point system. A base price cut by a single basing point seller makes freight absorption by his competitors more diffcult, but it does not bar them from entire portions of the market. Hence there is less pressure on competitors to meet it, and therefore a greater probability that it will be made.

The elimination of freight absorption is considered a salutary result by many, on the grounds that merely meeting a competitor's price is not really competition. We have seen, however, that competition in the steel industry is likely to take the form of freight absorption; that is, given the cost structure of the industry, both sales with and without freight absorption are competitive, each reflecting the different force and character of competition in different parts of the market. Since mill price reductions are not a real alternative to freight absorption, the prohibition of freight absorption involves a subtraction from competition and not an addition.

If the prohibition of conspiracy is beside the point, and the uniform f.o.b. mill pricing system undesirable, what is the appropriate alternative to the basing point system, if any? The answer lies in the reasons for which the basing point system was used. As we have seen, it produced certainty with respect to the structure of steel prices, and kept discrimination within certain bounds; it favored price meeting rather than price beating. The proper pricing alternative is surely one which puts back, so to speak, the uncertainties which the basing point removed and which lets competition, even including price discrimination, have the maximum possible effect on the prices paid by buyers.

The pricing method which best does these things combines features of both the basing point system and the uniform f.o.b. mill system. As with the uniform f.o.b. mill system, each seller is required to post a plant price and to sell f.o.b. at that price. Delivered sales are permitted, but they must include only the actual cost of the form of transportation selected by the buyer. As with the basing point system, sellers are permitted to absorb freight, but only if a competitor has quoted or can quote a lower price on the product type and size being offered. The last requirement forces sellers to make individual rather than collective decisions about freight absorption and prevents pricing from becoming completely routine. It also forces sellers to find out what their competitors are actually doing, and may lead to a more active, outgoing, and vigorous pricing policy.

Because sales under this method are made f.o.b. and because there is no longer a commonly accepted method for calculating delivered prices, exact prices at every point of delivery are no longer known in advance. It is more diffcult for a seller to know what prices he has to meet, and

more likely that he will beat rather than merely meet competing prices. It is also easier for buyers to play one seller off against the others.

Although this pricing method should produce a more effective type of price competition than the old basing point system, the difference will be in degree and not in kind. The plain fact is that rivalry in the steel industry and in similar industries is not likely to take the form of competition in price. The reason is not that conspiracy prevents it, or that steel producers are improperly motivated; it is rather that the conditions necessary for vigorous competition do not exist, as a matter of objective economic reality. Therefore, price competition of a substantial sort cannot be brought about through changes in pricing systems or through the artificial imposition of the symptoms of price competition. Unless and until the structural characteristics of the steel market are changed, if they can be, no tinkering with pricing systems will really pay off.

III

It would be very instructive if the preceding analysis could be tested against the performance of the steel industry since the elimination of basing point pricing in 1948 and the drawing up of the FTC steel order in 1951. Unfortunately, the period has been much too short; moreover, business was at such a high level for most of it that there was no particular pressure on prices. However, a brief look may be suggestive.

Very briefly, the FTC steel order prohibited producers from entering into any planned common course of action, understanding, or agreement, or from acting independently or otherwise so as knowingly to contribute to a planned common course of action, understanding, or agreement, to do the following: (1) fix the price of steel or any element thereof; (2) compile, circulate, and use lists of base prices and extra charges; (3) compile or circulate lists of freight rate factors; (4) adopt special pricing practices for particular classes of customers; (5) sell steel at prices calculated in accordance with a formula which produces identical delivered prices or which establishes a fixed relationship among prices; (6) fail to sell f.o.b.

In addition, the order provided that the FTC would not consider uniformity of price "alone and without more" as showing a violation of the law, and that it would not prohibit freight absorption as such "when innocently and independently pursued, regularly or otherwise, with the result of promoting competition." Thus the order, in its essentials, conforms quite closely to the pricing method suggested above as an alternative to the basing point system.

After being at or near capacity for a number of years, steel operating rates began to fall off in the fall of 1953. The period since then is

therefore the most significant from our point of view. The *Iron Age* reported, as early as September, 1953, that a few companies were again absorbing freight. In October, most companies formally announced that they would do so. According to the *Iron Age*, the policy was to consider each case individually, and to absorb freight only if there was evidence that a competitor was quoting lower prices. Producers were not offering to absorb freight to all buyers at a given locality, but only to those whose business was particularly attractive. The producers were planning to continue f.o.b. prices, and were not returning to the old basing point system. In December, the *Iron Age* reported that producers were going to a lot of trouble to make sure that competition actually existed before they absorbed freight, including a check to determine that their rivals actually produced the type and size in question. In July, 1954, the *Iron Age* reported that freight absorption might cost as much as 70 million dollars in 1954, or an average of $.75 to $1.00 per ton and that it had become a routine part of the business. It is clear, therefore, that freight absorption has been renewed on a wide front. There is no evidence, however, of the systematic, routine meeting of competitors' prices which characterized the old basing point system. There is also no evidence of price beating rather than price meeting or of a general increase in the forces of competition over the basing point days.

There have also been interesting developments in the transportation of steel. Under the basing point system, delivered prices were made up of base prices plus all rail freight, regardless of the method of transportation used. In practice, rail transportation, the most costly form, was used almost exclusively. A marked change began with the introduction of f.o.b. pricing in 1948; trucks, in particular, were used with increasing frequency. Figures for 1953, compiled by the *Iron Age*, show how far the trend has gone: on an over-all basis, trucks carried 53 per cent of total steel shipments, the railroads 44 per cent, and barges 3 per cent. Hence, the end of basing point pricing has clearly resulted in the use of varied forms of transportation. Since the cost of the form actually used now determines the price at the point of delivery and since the determination of freight costs is tricky even for a single form of transportation, uncertainty about competitors' prices has been substantially increased.

The steel industry's recent experience is inconclusive for the determining whether there will be a greater degree of price competition without the basing point system. No real answer will be possible until a number of years have passed and the industry has experienced varying demand conditions. It is significant, however, that the resumption of freight absorption almost immediately followed the drop in operating

rates. The pressure to expand sales when capacity is not fully utilized is clearly an important and ubiquitous force. It is also significant that there has been a major shift to forms of transportation ignored under the basing point system and that the freight absorption which has taken place has been on an individual and not a systematic basis. There have been some beneficial results, therefore, from the elimination of the basing point system. Perhaps the future will see more.

DISCUSSION

Walter Adams: Mr. Whitney's study of the movie decree is comprehensive and competent. The facts presented are up to date and accurate. Nevertheless, I disagree with Mr. Whitney's general emphasis and his unduly pessimistic conclusion.

The purpose of an antitrust decree is to "effectively pry open to competition a market that has been closed by defendants' illegal restraints." Such a decree cannot, however, in and of itself, effectuate a permanent change in industry structure or practices. All it can do is to break up or render impotent, for the time being, the monopoly power which violates the law. All it can do is to remove temporarily some of the artificial restraints which in the past had limited the freedom of competitors and customers. The test of a decree's effectiveness is not that it minimizes complaints by vested interests nor that it protects any group from economic hardship or inconvenience. The test is whether substantial competition has been restored to the market place; whether consumers have a wider range of choice; and whether competitors have more freedom and potential competitors greater opportunity than before. With this standard in mind—and remembering that the last of the movie decrees took final effect only last fall—my appraisal is less pessimistic than Mr. Whitney's.

First, it seems clear that seldom (with the exception of World War II) have independent producers been as successful as since the divorcement of the Big Five. With the vertical control over choice exhibition outlets broken, independents have enjoyed an unparalleled opportunity to market a quality product. Moreover, here is one case where a comprehensive divorcement decree is not likely to impede technological progress. As Professor Hellmuth has pointed out, practically all major innovations in the industry—the star system, multireel features, sound, and now three-dimensional films—have been made by what were minor companies at the time. Here is one case where integrated size has not given us better things for better living through research.

Second, as Mr. Whitney concedes, the public has benefited from an improvement in film quality. Though admission prices have gone up, the consumer probably gets more picture quality per dollar today than he did in 1948. In addition, he has more first-run choices than ever before. Finally, not least among his blessings is the greater frequency and wider distribution of foreign films—the superb sophistication of Alec Guinness and the unequalled dramatic talent of, say, Gina Lollobrigida. After a moment's reflection, Mr. Whitney will, I am sure, concede this point.

Third, the exhibitors have no doubt suffered. But it seems to me that neighborhood theaters, relying primarily on a steady stream of mediocre films, would have been injured by TV in any event. It is true, of course, that the divorcement decree destroyed the umbrella which the old monopoly system spread over the small fry. It is true that the decree (as well as the advent of TV) accentuated the difference in reward between good pictures and bad.

It is true that these changes were a painful experience for many exhibitors. This does not mean, however, that the changes were bad or against the public interest.

Finally, and probably most important, is a point Mr. Whitney treats only casually and nonchalantly; viz., the extent to which the government itself has undermined the effectiveness of the antitrust decree. In 1953, the Federal Communications Commission approved the merger of Paramount Theaters and American Broadcasting Company, recognizing the combination's right to produce movies for TV exhibition. The Commission also acquiesced in the control by Paramount Pictures of DuMont TV—the fourth largest network in the country. If this development foreshadows a general trend in the industry, we may—as Professor Hellmuth points out—be witnessing the vertical reintegration of the Big Five—the very integration which the antitrust suit sought to destory. Obviously, horizontal mergers between movie exhibitors and TV chains would vitiate the stimulus of interindustry competition. Obviously, vertical mergers of motion picture producers and TV exhibitors would revive the very industry structure which entailed a maze of trade restraints. This, rather than the antitrust decree, is a cause for concern.

The recent action of the FCC has, I think, demonstrated once again that government is not an agent of countervailing power; that, instead, government often supports the economic forces which breed monopoly; that the government's exercise of administrative or regulatory powers often creates the very restraints which antitrust is subsequently required to dissolve. In short, here we may have a case where government approves what the antitrust laws are designed to prevent—where government helps remake an industry in the image of the cartel.

SAMUEL M. LOESCHER: Mr. Marengo is indeed pessimistic about the prospects of increasing effective (price) competition in the steel industry by means of antitrust policy directed at trade practices. Rigidity in pricing is attributable primarily to the industry's structure. Therefore, he draws the conventional, and safe, academic conclusion that public policy should be directed at altering (if possible!) the structural characteristics of the steel market. Now most economists would probably subscribe to, and believe to be economically feasible, a policy of limited restructuring of the steel industry. But that extensive dissolution is a practical policy alternative is most unlikely. As Dean Edward Levi has reminded us ("A Two Level Antimonopoly Law," *Northwestern Law Review*, December, 1952, pages 567-568), the courts have yet to adopt a realistic percentage share test of illegal market control. Furthermore, in the unlikely event that the courts moved toward a percentage test, market control can be calculated only after a meaningful designation of the market, in terms of both geography and products. In adversary proceedings, arguments as to the market would represent no little war of containment.

As a consequence, unless we are to allow the quest for more effective competition in the steel industry to go by default, it will be necessary for public policy to concern itself with behavior and trade practices. Moreover, there are

important reasons for believing that an attack on trade practices offers opportunity for substantial improvement in terms of price behavior.

I should like to agree with the author that nondiscriminatory f.o.b. mill pricing does not offer the best alternative to the basing point system. But I cannot accept his conclusion that compulsory f.o.b. pricing would make for less price flexibility than the old basing point system. If nondiscrimination were the only practical policy alternative, I would readily cast my vote for f.o.b pricing for two reasons. First, the spatial distribution of sellers in the steel industry is such that the gain of important markets at the geographical margins by a firm which lowers its f.o.b. price is likely to be greater than the individual market losses suffered by the rival sellers. As a result, oligopolistic reckoning notwithstanding, some significant uncertainty exists as to whether all excluded rival sellers will retaliate. Such uncertainty differs markedly from the built-in automatic multiple-price leadership of the basing point system. Under the familiar formula, base price increases and decreases are bound to be met in the initiator's "natural" market, save for the effect of encouraging or discouraging access into this market to the rivals most distantly located. Secondly, geographical shifting demand, which we might call the Stiglerian effect, although less striking than in the cement industry, is fairly significant in steel since construction has recently been estimated to absorb 20 per cent of steel's output. Long-term as well as short-period peripatetic shifts in steel consumption should prevent a simple freezing of market shares based on stable intermill price differentials. Reconciling of conflicting interests without flagrant consultative collusion stretches too far the elastic possibilities of imperfect competition theory. However, there is something fairly definite and orderly about compulsory f.o.b. pricing systems which suggests that geographical pricing practices incorporating even greater uncertainties should be sought.

I agree with Mr. Marengo when he emphasizes that freight absorbing delivered prices were an inevitable quasi-competitive marketing technique in industries with market structures such as steel. I also agree with his emphasizing the distinction between the price policy restraining competition which an industry with a few sellers might wish to adopt and the mechanism—a system or formula—which could guarantee success in the price policy so long as each seller had merely the will to adhere to it. Mr. Marengo, however, believes that all rail delivered prices and the circulation of freight books were the essential mechanical elements of the basing point system. These elements permitted rival sellers routinely to meet and avoid the fears of beating competition when absorbing freight.

It seems to me that one's analysis of formula pricing must be carried further, and will be improved if one emphasizes imperfect collusion in place of the more conventional dichotomy of collusion and oligopolistic imperfect competition. In every basing point system which I have studied, there has always been the refusal on the part of sellers to offer to buyers located in each mill's "natural" market (in which freight is not absorbed) an option of a bona fide f.o.b. mill price. Bona fide f.o.b. mill prices are considered to be the posted base mill prices without fictitious premiums. Given bona fide f.o.b.

mill prices, several local buyers might wish to purchase from the mill and transport the product in the buyer's private, leased, or contract trucks. With uncontrolled trucking, there are no published transportation charges. More distant sellers find it not only difficult but virtually impossible to determine the destination cost of steel to the buyer. At least within the range where trucking is economically feasible, formula destination prices could not be ascertained. Therefore, a freight absorbing distant mill which seeks to penetrate many of his rivals' natural markets cannot meet competition, but on the contrary will probably win such patronage only through an inadvertent beating of competition. A distant seller either partakes in unsystematic pricing or he declines to penetrate.

The steel industry in 1935, after the demise of the NRA, simultaneously and arbitrarily imposed on truck shipments a surcharge equal to 35 per cent of the applicable rail freight. This action followed the passage of a resolution by the American Iron and Steel Institute. That such an action represented a collusive act seems unmistakable. Of course, given the fact that any basing point system involves profit reducing cross hauling suggests that the resulting collusion was imperfect. But by discouraging buyer's trucking, the formula of known destination prices was preserved, and achieved, if you will, effective collusion. Once trucking is eliminated or controlled by the seller (so that published transportation tariffs are made available), further overt collusion is unnecessary. The ability merely to meet competition is available to those who have the will to maintain the system.

Have the basing point decisions effectively altered trade practices in the steel industry? I believe the answer is "no"—and my reply applied especially to the period between September, 1953, and November, 1954, of operations substantially below capacity. I agree with Mr. Marengo that freight absorption during this latter period has been performed on an "individual" basis rather than routinely in accordance with a simple formula. But except for precluding the old practice of identical formula sealed bidding to state and local governments, the so-called "individual" meeting of competition still represents all the essential characteristics of a system for identical pricing. The only difference may be that in the absence of an organized distribution of freight books, and with the added presence of common carriers and sellers' controlled trucking, the verification of a much greater number of freight rates becomes a more complicated task. Errors of freight rate calculation may more frequently lead to some beating of competition.

There has been a transportation revolution in the steel industry in the postwar period as trucks now haul the majority of total steel shipments. The basing point decisions have been partly responsible for the change and a more rational and economical use of the nation's transportation facilities has resulted. However, the major advent of trucking of steel products does not appear to have brought about, to the extent which might have been expected, the erosion of a freight formula for purposes of systematically meeting competition. Recently I made a survey of steel companies, to which seven major (million-plus ingot ton capacity) and eight minor firms responded. It indicated that the overwhelming proportion of trucked steel products move

to buyers in common carriers, supplemented by the seller's contract, leased, and private carriers. In each of these cases of controlled trucking, tariffs are either filed with public commissions or the steel producers are able to publish truck rates to sundry destinations. With the exception of two minor steel concerns, the responding steel companies referred to transportation in buyers' contract, leased, or private trucks as being "small, relatively small, or negligible." I have been unable to determine as of this date if some practice may have been adopted so as to discourage transportation in trucks controlled by the buyers. Familiarity with controlled trucking in the cement industry, however, leads me to suspect that bona fide f.o.b. prices are not being offered.

An evaluation must necessarily follow concerning the FTC's cease and desist order which prohibits failure to sell on an f.o.b. basis. I believe that the Commission's order against the iron and steel industry is highly defective.

Although the FTC's findings of facts do not find conspiracy (implicit or otherwise), the initial complaint and the subsequent consent order are clearly phrased in the language of conspiracy. And even more important, the FTC appears to have blundered in failing to prohibit each respondent individually from quoting fictitious f.o.b. prices and refusing delivery to buyers who wish to use their own form of transportation.

That the Commission failed to draft an effective trade practice order for the steel industry is strikingly illustrated by an unsuccessful attempt of one major steel company to sponsor an industry-wide delivered zone pricing system for steel. In December, 1953, Republic Steel initiated for hot-rolled carbon bars a delivered price, based on an average freight factor from its mills, for each of 1,481 counties it normally served. That bona fide f.o.b. prices were not to be offered was apparent in Republic's statement that the "consumers in switching areas adjacent to mills have the option of free delivery or can come into the mill and pick up the steel themselves" at an f.o.b. price including phantom freight. Republic, at the time, also announced that it still intended to meet local competition on an "individual" basis. That Republic was taking the leadership and hoping that other steel companies would accept the invitation to establish an all-delivered zone pricing system can be inferred from Republic's October, 1954, announcement. This stated that Republic was abandoning its zone system because other firms failed to follow. Meeting of competition under a county zone system of delivered prices would indeed have been vastly more definite than even the old basing point system. Other firms in the industry may have feared a general adoption of the zone system because of the vulnerable elements of phantom freight which would have been inherent in single deliverd prices for entire counties. Moreover, systematic geographical price discrimination on an individual basis had been fairly satisfactory.

Some increase in effective competition in the steel industry, even in the absence of a major restructuring, would appear to be feasible. However, the current model of meeting competition on an individual basis, albeit an improvement over the older simplified base-price-plus-rail-freight formula, represents less of an innovation than can reasonably be expected of a progressive antitrust policy.

JAMES H. STAUSS: In his lucid analysis of the metal container industry, Professor McKie emphasized the economic consequences of the American Can case of 1950. Among other judgments, he said that "the gross structure of the industry has not changed very much and probably will not change much in the future." He also concluded, in view of the impact of the decree, that "a forecast of workable competition appears to be justified." I shall comment on these two judgments, and I shall do this in terms of market structure, performance standards, and mutually completing aspects of structure and performance.

In terms of structure, my impression is that the following situation prevails in the metal container industry:

1. The industry is, and probably will be, characterized by "fewness of sellers," although a significant number of concerns have little spots of business after the large bulk of the industry is accounted for with respect to sales.

2. The industry has, and probably will continue to have, two "large" sellers sharing most of the industry's output and several "small" sellers sharing most of the remainder. A similar generalization fits the realities of separate markets, regionally or locally.

3. The industry is free of cartelization, and it is prudent to expect a continued absence of collusion.

4. The impediments to entry are not, and probably will not be, seriously formidable insofar as patents and capital requirements are concerned. On the other hand, ease of entry is not characteristic of the industry; that is, the established leaders have, or are thought to have, critical advantages in the management and unified servicing of multiplant enterprise, in the quantity purchasing of raw materials, in the financing and carrying out of research and product improvement, in the possession of marketing know-how and historic patronage, and in the waging of non-price rivalry. It is not clear that ease of entry will be characteristic of the industry, even though the 1950 decree knocked out a number of formidable exclusionary devices, especially cumulative volume discounts, long-term requirements contracts, ties between the leasing of closing machines and the sale of cans, and supports for the dependence of can buyers on the closing machines of American and Continental. These devices, representing customers tied to the established can suppliers, once protected the major market shares. Yet, now that the exclusionary devices are temporarily or permanently outlawed, only certain buyers of cans offer a significant threat of entry through the manufacture of their own containers. It is not clear that this threat will be a decisive disciplinary force acting on the established leaders.

5. The structural conditions, which are oligopolistic, compound themselves into alternative sources of supply available to buyers. From one point of view, these alternative sources of supply are "enabling conditions" making it possible for buyers to select their sellers. In consequence of the American Can case of 1950, these enabling conditions were strengthened, because tying arrangements were broken, dependence on closing-machine leases was greatly reduced, and requirements contracts were shortened. The canning industry, much of which is effectively competitive, is more independent than before,

and it has an increased opportunity for choice among container manufacturers. From another point of view, however, the alternative sources of supply are "limiting" conditions that restrict in some measure the range of decisions and actions practically available to each container manufacturer.

As I see this structural situation, the two pertinent questions are these: (1) Are the buyers' enabling conditions equivalent to "genuine" or "real" alternatives of supply—in terms of downward pressures on price, upward pressures on product improvement, and opportunity to avoid price lethargy and strictly parallel action by sellers? (2) Are the sellers' limiting conditions equivalent to "genuine" or "real" disciplinary restrictions—in terms of a rivalry that compels the sellers to participate in downward pressures on costs and prices and in upward pressures on product improvement? The structural situation, present and prospective, in regard to fewness of sellers, dominant market shares, and impediments to entry, does not appear to represent "workable competition." However, this competition could emerge in a mixture of effective intraindustry rivalry, effective intercommodity competition, and successful meeting of performance standards applicable to the metal container industry.

In terms of performance, my impression is that the uncertainties are too great to justify a forecast of workable competition. I accept Professor McKie's judgment that small sellers reaching for enlarged market shares, as well as certain buyers threatening backward integration, will enhance price rivalry to some extent. I also agree that technological and service rivalry will act as a disciplinary process. On the other hand, the established leaders will probably safeguard their dominant shares through their superiorities in waging this technological and service rivalry. The downward pressures on price may not pervade the bulk of most markets, and parallel—and perhaps rigid—pricing may be common practice. It is too early, moreover, to estimate the future strength of intercommodity competition from fiber, plastic, aluminum, and glass containers, and it is not clear that the metal container industry would try to protect itself by reduced-price measures. Finally, a forecast of workable competition in the metal container industry must depend on how well the industry is meeting, and how well it is expected to meet, standards of performance in terms such as reducing costs, making price reductions pursuant to cost reductions, and keeping down its level of profits.

Although I believe that a forecast of workable competition is not now justified, I agree that the American Can case of 1950 has improved the economic health of the metal container industry. The case is notable, too, from the standpoint of the unprecedented control over business practices and dealings that the court decreed, particularly with respect to compulsory licensing of patents and compulsory extension of technological information. I suggest, however, that the District Court's interpretation of antitrust law in this case may be deceptive; that is, economists may conclude that economic power was cut with a sharp knife. As I read the opinion and the ruling, the emphasis is on "abuses" and on evidence of intent. In other words, antitrust law may prevent and suppress certain arrangements and behavior that "real" competitors do not engage in; but antitrust law, in its present state of legisla-

tion and adjudication, does not compel the anatomy and functions of workable competition. It does not prevent and suppress the anatomy and functions of large size, monopoly, oligopoly, or concentration, if any one of these phenomena simply exhibits economic power and only violates workable competition. Thus, in the American Can case of 1950, the district judge said, "I am not willing to burn a cathedral down because someone committed a sin therein."

RESEARCH ON THE BUSINESS FIRM

LIMITS TO THE GROWTH AND SIZE OF FIRMS*

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I. *Size Versus Growth*

There are two approaches to the question of the size of firms. The traditional approach attempts to explain size in terms of the balance of advantages and disadvantages of being a particular size. Another approach emphasizes the process of growth and treats size as a more or less incidental result of a continuous on-going or "unfolding" process. The first—which I may call the size approach—has found its exponents among those who stress the economies and diseconomies of large-scale production and among those who stress the monopolistic advantages and economic power of bigness. The second—the growth approach—has so far been expounded in any systematic form only by the "biological economists"—by those who view firms as organisms and conclude that they grow like organisms. That variant of the growth approach leaves no room for human motivation and conscious human decision and I think should be rejected on that ground. (See "Biological Analogies in the Theory of the Firm," *American Economic Review*, December, 1952, pages 804-819.)

I want here to suggest an alternative growth approach which, in common with the biological variant, insists that a predisposition to grow is inherent in the very nature of firms, but which, in contrast, makes growth depend on human motivation—in the usual case on the businessman's search for profits.

The analysis presented in this paper is most applicable to business enterprise in the form of corporations. It will be concerned only with industrial firms and only with internal growth. Growth by merger will not be considered. While it is true that merger in the broadest sense has been of great importance in the growth of firms—and of greater real significance, perhaps, than statistics of the percentage growth by merger for different firms would indicate—merger by no means accounts (at least in recent times) for even the major part of the growth of most large firms, as the studies of Weston, Schroeder, and others have shown.[1] Furthermore, I think it likely that growth can proceed just as

* I am particularly indebted to Carl Christ, Evsey Domar, and Fritz Machlup for helpful criticism of this paper.

[1] Fred J. Weston, *The Role of Mergers in the Growth of Large Firms* (University of California Press, 1953); Gertrude G. Schroeder, *The Growth of Major Steel Companies, 1900-1950* (Johns Hopkins Press, 1953).

far with or without merger, though not at the same rate. To show this, I want to consider growth without merger.

II. *Causes of and Limits to the Growth of Firms*

First, I shall be concerned with the causes of and limits to the growth of firms. It is convenient to divide the relevant considerations into two categories: those that are external to the firm and those that arise from the nature of the firm itself. For example, difficulties in obtaining capital or the existence of unfavorable demand conditions have been used to explain why some firms fail to grow, or disappear entirely. Conversely, a growing economy or changes in technology increasing the so-called "optimum size" of firms have often been given as explanations of continuous expansion. Such things do indeed have important effects on the rate of growth of firms. They are external factors which influence the speed and direction of growth but the importance of which cannot be fully understood without an examination of the nature of the firm itself. The more interesting question, to me, is whether there is anything in the nature of the economic institution we call a firm that induces growth, makes it possible, yet limits the rate of growth. This is the problem I want to discuss here: the internal incentives to and limits on growth—a theory of the growth of firms that does not relate to fortuitous external events.

The Problem of Planning. To begin with, let me stress an obvious fact, but a fact of central importance for the growth of firms: Successful expansion must, in the usual case, be preceded by planning on the part of the firm. Firms do not just grow automatically, but in response to human decisions. And if firms act on the basis of plans, it follows that they have some degree of confidence in these plans. The question therefore arises how a firm obtains the required degree of confidence. Unless it is assumed that knowledge is perfect and that uncertainty is absent—assumptions that are useless and inappropriate in this context —it is clear that a body of knowledge sufficient to sustain rational plans for action must be developed within the firm. What may broadly be characterized as managerial research will be necessary for the purpose. Consequently, some part of the managerial and entrepreneurial services of the firm must be available to work on the requisite plans whenever expansion is considered.

The fact that expansion must be preceded by research and planning, on the one hand limits the amount of expansion that can be undertaken at any given time and on the other hand permits continuous expansion through time. I propose to show that expansion itself tends to create opportunities for further expansion—opportunities that did not exist before the expansion was undertaken—and this for two reasons. First,

the execution of any plan for expansion will tend to cause a firm to acquire resources which cannot be fully used at the level of production contemplated by the plan, and such unused services will remain available to the firm after the expansion is completed. Second, planning itself and the execution of a plan will tend to absorb managerial services which will not be required in the operation of the enlarged concern and which therefore will be released upon completion of the expansion program, while at the same time the services that the firm's management is capable of rendering will tend to increase between the time when the plan is made and the time when its execution is completed.

The Continuing Availability of Unused Productive Services. Let us begin with the problem of using fully all services acquired. This raises two separate questions: Why does a firm acquire services it does not need? And why, if it acquires them, does it not use (or sell) them?

The answer to the first question involves a familiar analysis with an extended application. As long ago as 1832, Babbage set forth the principle that the most efficient output for any establishment will be that which uses a "direct multiple" of the "number of processes into which it is advantageous to divide" the production of an article. This is essentially what Austin Robinson a hundred years later called the "balance of processes"[2] and what Sargent Florence calls the "principle of multiples."[3] If a collection of indivisible productive resources is to be fully used, the minimum level of output at which the firm must produce must correspond to the least common multiple of the various maximum outputs obtainable from the smallest unit in which each type of resource can be acquired. The principle has usually, if not always, been applied only to machines, and even in this case Robinson has suggested that it may be necessary to plan production on a very large scale in order to use all machines at their most efficient level of operation. When, however, the full range of resources used in any firm is considered, including management, engineering, and even research personnel, as well as the minimum resources needed to sell the product, it is clear that this least common multiple may involve an enormously large output. This output will tend to be greater the larger the variety of resources and the more diverse the units in which they come. A firm would have to produce on a vast scale if it were to use fully the services of all the resources required for much smaller levels of output.

Obviously the output that will utilize most efficiently all of the firm's resources can only be reached if there is no limit short of this output on the supply of any one of them or on the market for the product. If

[2] E. A. G. Robinson, *The Structure of Competitive Industry* (Harcourt, Brace, 1932), pp. 31-33.

[3] P. Sargent Florence, *The Logic of Industrial Organization* (London: Kegan Paul, 1933), pp. 18-20.

there is any fixed factor in the productive operations of a firm, it will only be by chance that the firm will be able so to organize its resources that all of them will be fully used. The firm will, to be sure, use the services for which its resources were acquired to the fullest extent consistent with the lowest-cost combination of these resources for the amount and kinds of product it has decided to produce, but there is no reason to expect that it would be possible to make them come out even, so to speak. If the limiting factor were removed, additional services from some of the resources already acquired by the firm in the course of its operations would be available at no extra cost to the firm.

In addition, of course, most productive resources, including labor and managerial personnel, are capable of being used in many different ways and for many different purposes. Hence a firm in acquiring resources for particular purposes—to render particular services—also acquires a range of potential productive services, most of which will remain unused. This multiple serviceability of resources often gives firms a flexibility in a changing and uncertain environment which may become of great importance in determining the direction of growth.

Limits on the Supply of Managerial Services. There is one type of productive service which, by its very nature, is available to a firm in only limited amounts. This is the service of personnel, in particular, of management, with experience within the firm. Even if all other resources, that is, factors of production as available in the market, including the best managerial personnel, were in perfectly elastic supply, executives with experience within any given firm can only be found within that firm. The question, therefore, arises whether what I might call internally experienced managerial services are a necessary input in the process of expansion. It would seem so. Both general reasoning and discussions with businessmen confirm the hypothesis that a firm would never have a high degree of confidence in any extensive plan for expansion drawn up and executed exclusively by men with no experience within the firm itself.

There is little doubt that experience in a given environment does increase the ability of individuals to deal effectively with that environment, to anticipate and provide for circumstances they might otherwise have overlooked, and, in particular, to use other men to better advantage. This does not mean that indefinitely large plans for expansion cannot be made by any group, no matter how small or inexperienced, but only that such plans are apt to be less workable or reliable according as the scope of the plans increases in relation to the number of people with the requisite experience. To the degree that internally experienced personnel are not available, the firm (that is, the existing executive group) is likely to have less confidence in its ability successfully to

execute an expansion program. Management consultants, industrial engineering consultants, and similar advisory groups undoubtedly can render very important services. They reduce the extent to which a firm's own managerial resources must be left free for expansion purposes and widen the range of problems the firm can successfully handle. Nevertheless, not only the execution of plans for expansion but also the examination and approval of recommendations (after all, it takes time even to read reports let alone to pass on them) require a great deal of time and effort of the firm's own management.

Thus the making of expansion plans in which a firm has the requisite degree of confidence requires services which can only be produced within the firm. The production of these services requires time, and this limits the scope of a firm's expansion plans at any given time, but permits continuous extension of these plans through time. There are, of course, a number of restrictions on what can be achieved within any given period of time. Operations must often proceed in a certain sequence and many services required in expansion must be internally produced. These restrictions must be taken into consideration when the firm makes its expansion plans including its estimates of the time it will take before they are fully executed. But even to discover the size and composition of an optimum output under given circumstances requires an input of managerial and entrepreneurial services, some of which can be supplied only by individuals who have had experience within the firm. It is this restriction on the horizon of the firm, so to speak, that is significant from the point of view of its growth.

Let us imagine a case, for example, in which a firm has a fixed amount of experienced entrepreneurial services available for planning expansion; that the use of these in conjunction with other services will enable the firm to create a plan in which it has absolute confidence as to the outcome; and that for any more extensive expansion it will be necessary to fall back on the use of less experienced services, with the consequence that the firm will have less confidence in the outcome of actions undertaken in accordance with the plans. This lack of confidence can be looked upon as causing increasing costs—costs that are neither short run nor long run in the traditional sense. They are not short run, because plant and equipment are considered variable. They are not long run, because the considerations causing increasing costs are associated only with a temporary, though unavoidable, limit on the availability of services required for planning purposes. In both this and the traditional approach, managerial and entrepreneurial services are a fixed factor but costs are increasing, not because of some indefinable complexity due to size beyond the power of human beings to resolve even when organizational techniques are fully adjusted, but because of the limited

supply of experienced personnel at the time the firm plans its expansion. So long as executive resources can be added to a firm's staff, the supply of internally experienced management can be increased in the course of time, but the number of new executives that can be absorbed by a given firm in a given period and placed in situations from which they can gain the requisite experience is also limited by existing managerial resources and by the existing scale of operations of the firm. The rate at which the latter can be increased is precisely the problem that we are exploring.

In view of this limit on a firm's ability to extend indefinitely its plans for future operations, it is almost inconceivable that these plans can always, or even usually, be of such a scope that all of the firm's resources will be fully utilized. In general, there will always be services capable of being used in the same or in different lines of production but which are not so used because the firm could not plan extensively enough to use them. Such services are wasted for the time being. The type of resources for which this waste of service is most significant will depend on the nature of each particular firm. For some firms it may be machinery; for other firms the waste of administrative ability, executive talent, or the specialized connections of the sales force will be more important; for still others the significant waste may be of know-how, research-acquired knowledge, and engineering ability. That these last two are not an unimportant type of available, though unused, service is readily seen in the history of the expansion of individual firms in the modern world. The particular services that remain unused need not be of the same type as those that are actually used in current production; unused services are sometimes those of products and materials, skills and ideas, which are by-products of the primary productive activities of the firm.

Unused services are in themselves a challenge and an incentive to the ambitious entrepreneur. They are the excess services of resources which have been acquired and are needed in current operations; they are available for further production at no extra cost to the firm. An increase in production of the existing products of the firm which uses these services would, other things being equal, enable the firm to produce at a lower average cost. Of course, if a firm overestimates this free element in costs and underestimates the costs of other services that will be required, particularly increases in overhead costs due to additional production, a mistake will be made. The danger of "creep"—imprudent expansion on the basis of existing unused services—has frequently been expounded by accountants and others. But this does not affect the validity of the argument presented here. (See, for example, Robert L. Dixon, "Creep," *Journal of Accountancy*, July, 1953, pages 48-55.)

If the services were used in the production of products new to the firm, a competitive advantage would obtain over firms not having this free or joint element in costs. In many cases, of course, the ability of a firm to use such services depends on increases in knowledge and improvements of technique. As a matter of fact, many inventions and technological advances can be directly traced to the desire of a firm to take advantage of already possessed services not used in current production. Sometimes the profitability of devoting available resources to the primary lines of production has been so great that exploitation of minor lines has for long periods been neglected. That all profitable opportunities for productive activity known and open to a firm are not exploited together need not be explained by limited supplies of capital or other resources. As the investigations of Heller have shown, limited managerial services are often stated by management itself to be the important restriction on expansion. (See Walter W. Heller, "The Anatomy of Business Decisions," *Harvard Business Review,* March, 1951, pages 95-103.)

The Release and Growth of Managerial Services. If the preceding argument be accepted and it be agreed that the supply of the services of experienced personnel will, other things being equal, limit the amount of expansion a firm can plan at any time, then it is evident that further expansion becomes possible if, after the expansion plans are executed, such services become available to an extent greater than is necessary to operate the expanded concern.

Any substantial expansion involves not only acquisition of new personnel but promotion and redistribution of the old. Not infrequently a new subdivision of managerial organization is effected and a further decentralization of managerial functions takes place. Such reorganization may be done all at once or gradually as the progressive execution of the expansion plans calls for it. But the point is that both the new men brought in and the existing personnel of the firm gain further experience. Insofar as the increase in the experience of the men concerned is necessary to the execution of the firm's plans and was taken into consideration when the plans were made, the newly available services will be absorbed in the process of creating and operating the expanded concern. But it is impossible that all such to-be-created services be anticipated and their utilization provided for, not only because they include the as yet unknown experience of the planners themselves, but also because the variety of the potential services is unpredictable and their creation extends into the indefinite future.

Whether in carrying out an expansion program all of the firm's personnel are fully used depends partly on the policy of the firm. Firms whose general policy is to devote some part of their executive personnel

to the planning of expansion will have this personnel available for new planning as soon as any given plan is completed. At the other extreme, a firm's position may be such that those who make the plans also execute them and are therefore unable to devote time to additional planning until current plans are fully in operation. This policy is likely to be adopted of necessity by small and new firms whose executive staff is not very large. Nevertheless, once expansion has been completed and the operation of the firm fully geared to the new level of activity, additional productive services will be both created and released to provide the basis for further expansion.

They will be created because all personnel of the firm will gain additional experience as time passes. They will be released because as the range of services the managerial staff can perform increases, the new services will not be fully absorbed in the existing managerial tasks. Not only is there likely to be a generalized improvement in skill and efficiency but also the development of new and specialized services. When men have become used to working in a particular firm or with a particular group of other men in a firm, they become individually and as a group more valuable to the firm because the range of services they can render is enhanced by their knowledge of their fellow workers, of the methods of the firm, of the best way of doing things in the particular set of circumstances in which they are working. Individuals taking over executive functions new to them—either because the firm has added new functions or because the men are in new jobs—will run into difficulties and make mistakes merely because of the relative unfamiliarity of their work. When these individuals become more familiar with their work and succeed in integrating themselves into the organization under their control, not only will the effort required of them be reduced, but the range of services they are capable of rendering will be increased through experience. Both processes leave a residue of certain types of unused services in the wake of an expansion program.

The unused services thus created do not ordinarily exist in the visible form of idle man-hours but in the concealed form of unused abilities. The more complete use of the services of any given individual is supposed to be made possible by the process of promotion. Just as machinery after a point becomes less valuable and is "down-graded," so managerial resources may become more valuable and be "promoted." That promotion does not take care of all the increase in services that becomes available is the common experience of many firms in periods when growth is slow. Pressure from younger executives for advancement sometimes even creates for the firm a problem of maintaining the morale of personnel and cannot be entirely explained by the hypothesis that individuals tend to overestimate their own ability.

So far, managerial services have been treated as though they formed a pool of services differentiated only by the experience of the people rendering them. We have begged the question of the type of managerial services required to enable a firm to plan effectively and operate efficiently on an ever increasing scale. If the problems of adapting to rapidly changing external conditions are ignored, the simplest function of management is that of co-ordinating everyday operating activity within a given administrative framework, coping with minor problems, and improving existing ways of doing the same things. Growth requires initiative and imagination and thus a type of service different from that of the routine manager. The simplest type of initiating service is called for when expansion takes the form of increasing production of the products already being produced. Here management need only use on a wider scale the specialized knowledge it has already acquired. The managerial services available may be highly specific to the firm's existing products, but this makes it all the easier to expand as unused services develop, provided that additional goods can be sold at profitable prices. The analysis of this type of expansion falls within the framework of the conventional theory of the firm. The firm will expand the output of its products up to the point at which the increment in total costs equals the increment in total revenue, which, in the absence of diseconomies of scale, will be set by the well-known limitations on demand. This is familiar analysis and need not be elaborated.

The Utilization of Productive Services and Limits on Demand. The emphasis on demand as a restriction on the output of a firm arises because in the traditional theory of the firm, the firm is usually defined with reference to a given product. The theory of the firm serves primarily as a foundation for a general theory of price and output and hence is concerned with products rather than with the analysis of the firm as a many-sided economic institution. Once it is recognized that, in principle, the market of a firm in the wider sense is restricted only if the kinds of product it can produce are for some reasons limited, then it becomes clear that the flexibility and versatility of its own resources are the important factors governing the possibilities of its expansion. So long as there are profitable production opportunities open anywhere in the economy, a firm can take advantage of them if its resources are versatile—in particular, if its management is imaginative, flexible, and ambitious.

There are many examples of firms with vigorous and creative management who have substantially altered their range of products, sometimes completely abandoning their original lines and expanding their total output in spite of unfavorable demand conditions for their original products. There are, of course, many examples of other firms which

were not able to make the required adjustments. In such cases, failure to grow is often incorrectly attributed to demand conditions rather than to the limited nature of entrepreneurial resources.

There is not time here to examine this problem in more detail. Insofar as a firm is organized to produce only a given range of products, any limitations on the market for those products will prevent the firm from expanding the production of them. This is likely to mean that the firm will be unable to use fully its productive resources. A versatile type of executive service is needed if expansion requires major efforts on the part of the firm to develop new markets or entails branching out into new lines of production. Here the imaginative effort—the sense of timing, the instinctive recognition of what will catch on or how to make it catch on—becomes of overwhelming importance. These services are not likely to be equally available to all firms. For those that have them, however, a wider range of investment opportunities lies open than to firms with a less versatile type of management.

The most effective restriction on the versatility of executive services is that which stems from a lack of interest in experimenting or a lack of confidence in dealing with new and alien lines of activity. I say that this is the most effective restriction because mere specialization of managerial knowledge and ability is not itself a serious bar to a firm's branching out into new lines of activity if existing executives are sufficiently interested and confident to bring into the firm people possessing other relevant knowledge and ability. But it often happens that the horizon of management is extremely limited, particularly in smaller firms. Content with doing a good job in his own field, the small entrepreneur may never even consider the wider possibilities that would lie within his reach if only he raised his head to see them. If occasionally he gets a glimpse of them, he may lack the daring or the ambition to reach for them, although he may be an ambitious, efficient, and successful producer in his chosen field. Specificity of managerial resources means that some of the managerial services most essential for expansion are not available to the firm even though other managerial services essential for efficient operation in a particular field are fully available.

It is not helpful to dismiss this lack of vision, of confidence, or of experimenting ambition as an example of a failure to attempt to maximize profits, for they are intimately connected with the nature of managerial ability itself and must be reckoned as a limitation on the supply of specific types of productive services. After all, even a preliminary investigation into the possible profitability of any particular type of expansion presupposes a prior decision as to the allocation of managerial services between normal operations and the extension of these operations—a decision which, by its very nature, cannot in the

first instance be the result of a careful analysis of anticipated costs and revenues, since before such an analysis is undertaken the decision that it should be undertaken must be made. Whether such a decision is made at all is often a matter of temperament.

III. *Are There Limits to the Size of Firms?*

The managerial limits to growth discussed above are rather different from the type of limit on the supply of managerial services that is implicit in the traditional theory of the firm. There it is assumed both that the factors of production are in perfectly elastic supply and that the long-run average costs will at some point start rising—a situation which fundamentally can only be due to the quality of managerial services. The chief difference lies in the fact that imagination and ideas are not confined by time and space while the administrative activities of a single individual must be so confined. There is no known limit to the former. But there is to the latter, and from this it has been deduced that there must be a size of firm beyond which the services required for its efficient operation simply cannot be supplied by mortal men. This deduction is frequently stated as if it were an empirically established fact. The complexity of structure and the scope of activity are believed to become such that even the minimum decisions required of the chief executives in order to ensure the requisite degree of co-ordination are so difficult or so numerous that the firm must suffer in efficiency. Costs of production would therefore be greater in very large firms than in smaller firms—the so-called "diseconomies of scale" would overshadow all economies.

The planning of appropriate changes in the administrative organization of a firm is part of the planning of an expansion program. To some extent the kind of services necessary to effect this type of reorganican be hired. Just as techniques of production appropriate to large-scale operations are known and can be adopted from the outside, as it were, so known techniques of administration can be learned from the outside. Changing organization as a firm grows is very largely a progressive decentralization of authority. By its very nature, decentralization of this type cannot precede to any significant extent the expansion of the firm but must develop more or less simultaneously with it. Some firms may be incapable of effecting the appropriate administrative reorganization—for example, the existing executives may be unwilling to relinquish any of their personal control. These firms will find themselves unable to operate efficiently on a larger scale and will run into trouble as they attempt to expand. While some executives may be insufficiently used, others will be overworked, presenting a truly fixed factor, and diminishing returns will proceed with a vengeance.

We do not know how effective the decentralization of authority can be as a means of keeping costs per unit of output from rising as a firm expands. Reliable empirical evidence does not exist and all studies of the matter are inconclusive, but there is no evidence that a large decentralized concern requires supermen to run it. It does require more men who are competent to make high-level business decisions and who have had experience with the particular kinds of problem with which the firm has to deal. Neither is there significant evidence that the ability to fill the higher administrative positions is excessively rare or that the demands on the men occupying these positions exceed their ability to cope with them effectively.

As to the problem of co-ordination, a strong case can be made for the proposition that as a firm increases in size and its various parts obtain a greater and greater degree of autonomy, the real issue is not whether the whole thing becomes unwieldy but whether it should properly be called a single firm in any economic sense. For many analytical purposes, we must treat some of the parts of the firm as having an independent existence, while for other purposes we must recognize the nature of their interdependence in the administrative structure. As administrative co-ordination becomes more tenuous with increasing size, efficiency becomes less a matter of expert co-ordination and more a matter of the efficient operation of virtually independent parts. It is common knowledge that one department of a single firm may be efficient while other departments are inefficient. Some department heads are good and some are bad. I suppose that if an inadequate manager is placed in charge of a department, this is, by definition, poor co-ordination on the part of some central authority. But it need not be looked on in this way. There are plenty of poor managers in the business world—in responsible positions, too—and the large firms undoubtedly get some of them.

Co-ordination is relevant to efficiency only insofar as co-ordination is required and is attempted. That central control can be dispensed with over wide areas has surely been amply demonstrated by many large firms in the present-day economy, and that the end is not yet in sight is generally admitted. Neither the conception of a fixed factor nor the analysis of the diseconomies of scale is relevant in these circumstances. In the process of growth the "organism" radically changes its form; the firm becomes less "organic" and, indeed, less of a "firm" in the pristine economic sense.

This suggests an interesting paradox. The growth of firms may be consistent with the most efficient use of society's resources; the result of a past growth—the size attained at any time—may have no corresponding advantages. Each successive increment of growth may be

profitable to the firm and, if it uses otherwise underutilized resources, advantageous to society. *Ex ante,* the economist interested in resource allocation should approve. But once any increment of expansion is completed, the original justification for the expansion may fade into insignificance as new opportunities for growth develop and are acted upon. In this case, it would not follow that the large firm as a whole was any more efficient than its several parts would be if they were operating (and growing) quite independently. *Ex post,* the economist might disapprove.

MANAGERIAL MOTIVATION AND THE THEORY OF THE FIRM

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This paper is essentially a report on a research project undertaken in collaboration with Dr. Manford Kuhn, social psychologist at the State University of Iowa. His part in the formulation of the conceptual apparatus abstracted herein and in the development of appropriate research techniques has been a major one. This project is now also being carried forth independently, as the testing and application get under way.

The paper will include: (1) a statement of the importance of the motivational assumption, especially to the theory of the firm; (2) a consideration of certain methological issues involved in examining such assumptions; (3) a short résumé of recent modifications of the assumed motivation; (4) a capsule description of "self" or "reference group" theory, as a promising general orientation from which to examine motivation; (5) a reformulation of motivation in terms of this theory; (6) a partial structuring in such terms of existing knowledge of the manager and his role; (7) suggested lines of research; and (8) possible research techniques.

Motivation has long been important, if often implicit, in economic analysis. In our particular economic system, featuring the business firm, managerial motivation is of special importance. Yet, few attempts have been made to systematically study managerial motivation, to isolate the factors that may influence and condition such motivation, and to bring economic motivation into the orbit of motivation generally.

The question of managerial motivation has thus far been handled primarily by establishing simple assumptions as crude first approximations. Thus most economic theory (especially the theory of the firm), the bulk of applied economic analysis, and much public policy assume profit maximization as the paramount goal of business and businessmen.

Establishing managerial motivation by assumption rather than by empirical means has become somewhat difficult to justify. Evidence of a variety of managerial goals continues to accumulate; our changing social and political institutions and attitudes have carried obvious motivational implications; and the economic theory and public policy predicated upon a single simple motivation have recently been subject to critical re-examination. Meanwhile, the concepts and researches

of social psychology, sociology, cultural anthropology, clinical pyschology, and psychiatry have made available new findings, approaches, and techniques relative to motivation.

Why has systematic study of managerial motivation been largely lacking, at least until very recently? One partial explanation has been reluctance on methodological grounds. Profit maximization is an assumption which is useful in constructing a model. To study this or any other assumed motivation, it is suggested, may involve a misunderstanding of the methodology of model building.

The realism or accuracy of the initial assumptions of the model is not, it is argued, what matters. It is the ultimate usefulness of the model that counts. If the model is not useful, then it is time to go back and tinker with the assumptions if need be, or to build another model. If the model is useful, however, then the assumptions matter little.

Assumptions, in short, should mostly not get in the way. They should be simple and clean cut in order to enable us to build models that are internally consistent and that give determinate results. A simple, unrealistic assumption might prove to be better and more useful than a realistic but complex or variable or ambiguous assumption. Thus many economists deny that recent modifications of the assumed motivation of profit maximization are necessarily a step forward.

One of the more explicit statements of the methodological case for such simple assumptions as profit maximization is found in a recent book, *A Textbook of Economic Theory*, by Alfred W. Stonier and Douglas C. Hague. They defend the assumption in these terms (pages 87-88):

> "Rationality" in the theory of the firm implies that the individual producer aims at earning the greatest possible money profits Now, no economist believes that all business men do, in fact, always maximise profits, nor does he necessarily believe that they should do so. But every economist wants his analysis of the individual firm to enable him to point to a single position where, in given conditions, the firm will be in equilibrium. It is therefore essential for him to make some assumption of this kind. If no such assumption were made, there would be no single equilibrium for the firm in any given circumstances. It would be very difficult to produce any definite explanation of the way firms fix output and prices at all

Later, Stonier and Hague also assert (page 499) that "the assumption of 'rationality' amongst business men seems a most reasonable one to make until empirical research provides a better hypothesis; and so far it has failed to provide one."

If such positions reduce to this assertion that profit maximization is the most plausible assumption yet available, one may register reservations or tentative disbelief, but the burden of proof is admittedly on the critic. If this position means that if two assumptions are equally plausible or if the relative plausibility is not known, the simpler assumption is to be preferred, again no serious quarrel can be sustained,

provided, of course, that the greater simplicity of the one does not discourage anyone from investigating relative plausibility.

Perhaps the most disturbing undertone in the Stonier-Hague argument is the suggestion that simplicity is a prime value. The difficulty here goes beyond the fact that determinativeness alone may not always serve predictive ends. There also seems to be a good deal of prejudging as to the degree of simplicity which may be found at the end of a trail of research.

Despite such methodological concerns, there has been a tremendous amount of effort devoted since World War II to the modification of the previously assumed motivation of the manager. Economic theorists, students of business organization and management, businessmen and their spokesmen, and a host of others have either tinkered with profit maximization or have proposed additional or alternative motives. Out of this welter of opinions certain tentative conclusions emerge: (1) There is still considerable support, among both scholars and businessmen, for the primacy of the profit motive. (2) There seems to be an increasing tendency for this motive to be translated into something longer run, broader, and less precisely defined than the classic concept. (3) Other motivations of an economic character, such as preservation of the firm or maintenance of the size and position of the firm, are held to be of major importance. (4) The so-called "noneconomic" motivations are now taken much more seriously, despite the evident difficulties involved in measurement. (5) The complexity and variability of motivation have been recognized and some hypotheses have been suggested.

Thus many have groped toward a reappraisal of managerial motivation and in the process have moved a long way from the traditional concept of profit maximization. Most of these analyses continue, however, to treat the manager as an autonomous, isolated individual rather than as a member of groups and a participant in a culture. There has also been little attempt to apply what is known about motivation per se or motivation in other sectors of human behavior to the economic realm. There has also been little or no interest in the use of data relevant to managerial motivation in the construction of a general theory of motivation.

There now appears to be available an approach which might allow the fruitful re-examination of managerial motivation. From what was long termed the symbolic interactional approach has come what is now increasingly referred to as "reference group" or "self" theory. A capsule description of this approach, with a few of the attendant definitions which are of special interest to us, might now be in order. We may conveniently divide this brief résumé of self-theory into two general parts: a consideration of the nature of the world of man's

experience and a consideration of the nature of the person himself.

For the self-theorist, human beings do not live in a universe the events and objects of which have intrinsic meaning for and bearing upon human experience and behavior. They live rather in a universe mediated to us through social definitions couched in language. The stimulus-response-oriented researcher, in one of those rare occasions in which he attempts to use human subjects, characteristically puts his "subject" in an experimental room which he describes as a "neutral situation" and then subjects him to a predetermined "stimulus." The self-theory-oriented researcher, adhering to the idea implicit in "four walls do not a prison make," takes the view that he does not know whether plain gray walls make a neutral situation unless he has the relevant attitudes of the participants. Nor, for that matter, does he know the objects which he is going to vary without getting the relevant definitions from his participants.

No objects or events have "intrinsic stimulus value" for human beings. Those concatenations of events which we think of as objects have become objects as a result of the structuring of language. We experience them and behave toward them not in terms of any essential nature they may have but in terms of their meanings which they have as a result of language.

To understand the nature of the person, understanding of status and role and how they are acquired is necessary. When a child is born into some specific family, he is also given a specific status and assigned a specific role. Statuses are the building blocks—the smallest units of which any social group is made. They are the various positions, quite apart from the individuals who occupy them, which constitute the structure of a group. Every status, thus considered as a position in a group, has inseparably bound up with it a function to be performed. We refer to this function as a role. A role, like its correlative status, is defined quite apart from the person who is performing it. A role is a prescription, a recipe, a socially expected plan of action. It is an accepted and sanctioned proper-thing-to-do, together with the proper-way-to-do-it.

Each status and role derives its significance from the total configuration of statuses and roles of which it is a constituent part. No status, no role means anything by itself. An individual learns to occupy a status and to play a role by learning not only the rights and duties of his status and the requisite behaviors of his role but also those of all the other persons in the group or social system of which this status and role are a part. He must not only behave in such a way that the expectations of others will be met, but he must also be able, reciprocally, to anticipate correctly their behaviors.

We must distinguish, at this point, between those groups of which we are officially and formally members (called "membership groups") and those groups with which we feel self-identified (termed "reference groups"). It is the latter—the reference groups—which contain our "significant others" whose members' judgments we take into account and by which we identify ourselves as social objects. We may be, for example, a Baptist, a father, and a civil engineer. Each of these as a reference group provides us with relevant norms which we have taken as our own to be applied in certain kinds of situations.

The crucial significance of the self as a social object is that it is the only common object in all of the widely varied situations in which we participate. As such, it comes to serve as the anchoring point from which to make judgments and subsequent plans of action toward the many other objects in each specific situation. There is nothing mystical about this self. It consists of the attitudes (plans of action) toward the self as an object. We may think of it as consisting of all the relevant answers the individual might make to the question, as he would apply it to himself, "Who am I?" There is no way to answer such a question except by referring to oneself as a member of the groups that he feels identify him; or by referring to social categories which his reference groups hold to be significant in identifying him; or, finally, by referring to evaluations of himself which hinge on norms held by his reference groups. In any of these events, his answers are attitudinal statements which are the best indices of what he will do in any situation.

In terms of such a general orientation, how does one approach motivation? Self-theory would first lead one to reject the proposition that motivation is either individual or biological. The idea that motivation is individual has led us to focus attention on the solitary person, at the expense of a consideration of group norms and expectations. The idea that motivation is biological has resulted in attention to neural and glandular matters to the veritable exclusion of symbols and communication. The two ideas combined have led us to attend to ontogenetic sequences with individuals as units rather than to uniformities within groups and differences among groups. Our inability to discover much has been obscured by our failure to realize the circularity which characterizes explanations which have been made by constructs such as "drives," "survival," and "individual differences."

What, then, do we mean by motivation? Because it commonly points to the goal toward which behavior is directed, what ever else it may include, we may define it as the purposeful organization and direction of behavior. Inasmuch as goals are not implicit in the organism but are acquired through social participation, the word "purposeful" is

intended to put our use of the term motivation entirely on the social level of analysis.

Roles are the motives of men. Considered from the standpoint of groups, roles are the recipes for behavior. They are the symbolic statements of what ought to be paid attention to, what kind of action ought to be taken, with whom, toward what objectives. Considered from the standpoint of the individuals who play them, roles—once adopted—are the very definitions of the persons themselves. John Smith, President of X Corporation, does not define himself as "one who plays the role of president of X Corporation." He *is* President of X Corporation. This may not be all that he is, but the other things which he is are of the same order. The role is antecedent to the individual who adopts it, who by adopting it both defines himself as an object in terms of it and takes over the socially approved plans of action which it comprises as his own. They are then his motives.

In order to define a role, we must specify what attitudes constitute it. Attitudes are the plans of action toward the objects which are significant to the role being played. Their counterparts in the structure of the group are the norms which serve as the social definitions of situations and of roles. The role, then, is the over-all plan of action of which the attitudes are the constituent parts. The role as the role-player himself conceives it is the large design of motive, but one must not conclude that it is simply a sum of the subsumed attitudes, for any one of them makes sense only in terms of the role as a whole.

The term "attitude" is commonly used by social psychologists to mean a persistent tendency to act in some specific way. We accept this definition, provided it be understood that the term refers to events at the symbolic (social) level rather than to events at the physiological level. By attitudes, we mean verbal statements which constitute blueprints for behavior. These statements indicate the ends toward which action is directed, the justifications for holding these ends or values, the proper methods of achieving the ends, and the proper feeling and evaluation regarding degrees of success or failure in achieving the ends.

Motivations differ, of course, not only between groups but within groups. In any given group we do not find a standard motivation for two reasons. Each member belongs to a number of other groups which may have different or even conflicting values; and the group includes a number of different kinds of roles. Yet the group's very existence hinges on the common acceptance of a minimal common core of values for every member; so to establish the fact that an individual identifies himself with a particular group is sufficient to enable prediction of his motivation for a considerable range of behaviors.

The aim of science is to establish the most economical ways of describing the regularities of behavior. It may appear that we have here discarded earlier theories of dependable regularity of motivation (e.g., profit maximization, biological drives) without offering in their place any economical method for establishing regularities in the tremendous variety of motives described by social roles. It is true that the methods needed are only in process of being formulated and tested. Yet enough has been done already to establish the possibility of determining with what reference groups individuals feel identified and of finding relatively high correlations between these identifications and significant attitudes toward a wide variety of situations.

If one accepts this general frame of reference, then the intensive study of the role of the manager is the clearly desirable avenue toward the delineation of his motives. We shall now merely suggest some of the types of information presently available which bear on the role of the manager and on the manager's conception of that role. Any sketch of the social role of the corporate executive must start well beyond the corporation itself. Our first concern would be with the larger socioeconomic-political environment within which the contemporary firm and its leadership must operate. This familiar environment features not only such visible elements as big government, big labor, and other competing power blocs, but also an extensive and influential body of attitudes. These forces and these attitudes furnish many of the limits, constraints, and inducements which condition business motivation and behavior.

The manager must then be examined within the setting of the firm itself—often a corporation in which the stockholders have a rather nominal control and in which an apparently autonomous management appears to largely run the show. The preoccupation of the executive with his corporation as a sort of independent entity, whose welfare is to be maintained and protected, is powerfully reinforced by the fact that he is a member of a group interested in the same things. Modern management—especially in the large corporation—operates in a group setting, with group decisions—and group attitudes, constraints, and aspirations—although individual roles may be sharply differentiated. Members of management play a distinct role in the corporate scheme of things, and within the confines of that general role there are dozens or hundreds of specific roles. Each man attempts to fulfill his role, and if he is blocked in his attempt to play this role, he is frustrated and he often resists, although he may ultimately accommodate.

In his role playing, he is also concerned with his groups "outside" the corporation—in the community, neighborhood, club, and home.

There is, of course, some carry-over of his managerial role. William Henry notes (in *American Journal of Sociology,* January, 1949):

In both its economic and its social aspects the role of the business executive is sociologically a highly visible one. It has clearly definable limits and characteristics known to the general public.

This role comes to have compulsive power as far as the manager is concerned. Chester I. Barnard has observed (as reported by R. Richard Wohl in *Change and the Entrepreneur,* pages 9-10):

Often enough, an individual will be confronted with an offer to take on a particular job. He may think this job distasteful or hazardous. He may not wish to take it on. He is not overtly compelled to do so; he is invited to accept or reject the tender. But he accepts it. For should he refuse to accept it, he would lose caste with his associates, a consideration which rules out the apparent discretion he supposedly enjoys. He takes the task, and works at it, because part of his "job"—his role—is to deal with it. . . .

The role played and the personality of the man playing it are not unconnected. Henry further comments:

It is not a game that the person is playing; it is the way of behaving and thinking that he knows best, that he finds rewarding, and in which he believes. Thus, the role as socially defined has its counterpart in personality structure. To some extent, too, the personality structure is reshaped to be in harmony with the social role

He adds, however, that the necessity for such reshaping is minimized by the initial selection process. Henry has undertaken an intensive analysis of the personalities of a group of over one hundred successful business executives in various types of concerns. He has found eleven personality characteristics shared by this group. He has also concluded:

The successful executive represents a crystallization of many of the attitudes and values generally accepted by middle-class American society The value of accumulation and achievement, of self-directedness and independent thought and their rewards in prestige and status and property, are found in this group. But they also pay the price of holding these values and of profiting from them

This analysis suggests, of course, that research has scarcely begun. It may also give some clue, however, as to lines of research that hold promise and which might now be explored if the orientation proposed herein is to be tested or applied.

It will be necessary to identify the values and norms of the larger American society in which the manager lives and functions, presumably by such empirical means as content analysis and attitude measurement of these values. It would then be possible to compare and contrast these over-all values with those values which have been held by managers alone, probably as the result of their special reference-group identification. An inquiry could then be conducted into the differential types of associations holding these special "motivational vocabularies" which mark the manager off from the other members of his society.

It would be important also to determine how managers define the over-all society and how they see themselves in relation to it. How are

the groups and categories of our society defined as social objects by managers? What channels of communication, mass or otherwise, are used by managers and what definitions and values do these channels purvey? How differently do those who play other recognized roles in society define that society?

Another crucial research tack would have to do with motive blockage. What happens when the group-held values, such as that of profit maximization, are perceived by managers to be blocked by action of government or labor? Under what conditions is there conflict, under what circumstances is communication cut off, and when is there accommodate change in values and role?

A number of studies along historical lines are also needed. Just how has the role of the manager changed during the past several decades? Specifically, what changes have occurred in the manifest and latent functions of the corporation to the larger society, in the system of roles constituting the structure of the corporation, in managerial perceptions of and attitudes toward these changes, in the vocabulary of motives used by corporation managers, and so on?

Finally, it would be important to examine the whole range of groups with which managers feel identified. If, for example, they do feel identified with their communities, social cliques, and families, it would be useful to explore to what extent the norms from these groups converge to a single value-system including that derived from the managerial role itself and to what extent they conflict with each other. If they do conflict, how are they handled? Do they become compartmentalized, in accordance with norms supplied with the managerial role itself, or do they complicate his motives as manager in some regular and describable ways?

A final question remains. Are there effective research techniques available with which this approach can be tested and applied? A theory without research techniques is a mere set of circularities—an attempt to explain by naming. The theory which we have set forth in this paper is well over half a century old, but only within the past decade have research techniques appropriate to it been employed. Fortunately, however, the major difficulty has been in coming to some agreement about the class of phenomena which is to be investigated. Now that there is a growing agreement that the self is a set of attitudes, we are able to bring to bear the techniques of attitude measurement which have been developed over the past quarter to the point where Newcomb can speak of measurement of attitudes as the greatest technical achievement of social psychology. The techniques we are able to employ in the identification and measurement of self-attitudes are thus ones which are already considerably refined and rather rigorous.

Empirical treatment of self-attitudes, nonetheless, is in its infancy. Although the application of attitude-testing techniques is now possible, there remain some complicated problems besetting the researcher into self-attitudes. First, it is very difficult to know what kinds of items to construct for inclusion. Second, there is the very great danger of suggesting responses to the respondent. Third, there is the possibility that the self-attitudes which are elicited will be those which are relevant only to highly limited situations.

A self-attitude test has been constructed which meets all of these difficulties. It consists of asking the respondent to give, as if to himself, twenty different statements in answer to the question, "Who am I?" In asking this pertinent but very inclusive question in this way and by requesting multiple responses from each respondent, the formulation of relevant items is left up to the respondent. Thus the first problem is solved. We may assume that when the respondent formulates the items himself they must be relevant, at least to him. By asking such an inclusive question as "Who am I?" and by asking the respondent to direct it at himself and to answer as if to himself, we minimize the possibilities of suggestion to the vanishing point. Finally, by phrasing the question in this extremely general form we minimize the risk of cueing in the specific situation under which the test is being administered.

This test—termed the "Twenty-Statements Test" by its authors, Manford Kuhn and Thomas McPartland (see *American Sociological Review*, February, 1954)—is what is known as an "open-ended" test, which requires for any kind of systematic treatment of results some kind of content analysis of the replies. The most useful content analysis which has been made of replies to this test is the sorting of statements into those which are "consensual" and those which are "subconsensual." A consenual statement is one which requires no further explanation in order to be understood by the analyst or anyone else. A subconsensual statement is one which refers to norms which vary and which must be inquired into if the statement is to be at all denotative. Significantly, it turns out that the consensual statements, in overwhelming proportion, refer to the respondents' statuses in social categories and groups. It further emerges that respondents, if they have any consensual statements at all to give, give them first.

We earlier made the proposal that it is necessary to know how managers define themselves in order to find out the regularities in their motivations. We have now suggested a probable line of attack. We must ask what we want to know. If this sounds simple-minded, we must remind ourselves that the habit of asking some other, perhaps quite irrelevant, question (e.g., "What do you see in this ink blot?")

is fairly endemic in our society today. We have come as a society quite prematurely to the conclusion that man is irrational, and that there is no use asking people who they are and what they are doing or what is important to them. We have here suggested some direct questions which have demonstrated initial promise and for which there are some fairly rigorous techniques for manipulation already in existence.

We have advanced in this paper the suggestion that self- or reference-group theory may provide a useful approach to managerial motivation, and that it has effective associated research tools. If this claim proves by inductive test to be valid, as we hope that it will, then it will have demonstrated that the regularities of human behavior are such as to support the proposition, not that man is irrational, but that he is rational in a broader, more inclusive sense than previous models have been able to describe.

DISCUSSION

ALBERT LAUTERBACH: By agreement with the chairman, I should like to use most of the time available to report briefly on research which I carried out last summer, with the aid of the Social Science Research Council, on managerial attitudes in Great Britain, Norway, Sweden, and Western Germany. All of these countries are characterized by the coexistence of private, public, and co-operative enterprise, in varying forms and proportions. It was the specific aim of my study to explore the perception by managers of the managerial function as such, managerial incentives and success, division of responsibilities and risk-taking, the qualities desired in executives, the leadership role of managers, and the impact on management of national and cultural differences.

My project was meant to be a pilot study, and no quantifiable results were aimed at. Those interviewed, however, included a cross-section of managers in large private corporations and medium-sized family enterprises in a variety of industries, and managers of publicly and co-operatively owned enterprises; also union officers and shop stewards and research workers and public servants in related fields. The managerial sample included many persons who had had executive experience both in private and in public or co-operative enterprises.

The appointments were based on suitable contacts and introductions, and the interviews were semistructured—the prepared questionnaire was used in an informal and flexible way. The total number of interviews was 134, including 75 managers, 19 union officers and shop stewards, and 40 public servants and researchers. The results obtained should be interpreted as raw material in formulating pertinent questions, in throwing some light on the multitude of variables involved, and in posing some promising hypotheses for future testing. With this qualification, the results can be summarized as follows:

1. The ownership situation carries far less weight in determining the basic attitudes of managers in most kinds of enterprises, especially the large ones, than has traditionally been assumed by supporters of capitalism and socialism alike. Ownership, of course, remains of considerable importance in its legal and financial aspects, but for managerial attitudes other variables—such as size and organization—appear to be of equal or greater impact. This was emphasized by many of the managers themselves as well as members of other groups, including labor. I was especially impressed by the remarkable success of certain enterprises in Germany which have long been ownerless; they have been managed effectively by able men without anyone really knowing for years to whom these enterprises were going to belong eventually—to private owners, to the employees, to the state, or to foreign interests. The personnel director of one of these enterprises—a very large one—commented as follows: "We have assumed a certain basic capital for the balance-sheet, in a fictitious way; but there really are no stocks. Legally, it is an absurd situation. But we want to perform as if the plant belonged to us, that is, to both management and the employees."

2. The personal qualities of a manager are widely considered the most important element both in his attitudes and in his performance. Technical competence is taken for granted as a requirement in specific jobs, but for top management it is often rated less important than organizational gifts, vision, and a strong personality in general. For the rest, the personal qualities required in managers are frequently summarized as "character," meaning as a rule the ability to get on with people, to participate in teamwork, and to supply leadership without authoritarian traits. The significance of personality variations in managers was stressed especially by labor representatives in Sweden and Germany. Persons with the managerial qualities mentioned are widely judged as capable of performing well in any ownership form of comparable enterprises—private, public, or co-operative. Actually I found interchange of managers between these ownership forms to be fairly frequent, especially in Britain and Sweden.

3. Nonbureaucratic and competitive forms of management organization are almost universally regarded as essential if the best personal qualities of managers are to work out in practice, regardless of how the enterprise is owned. In particular, a sharp distinction is often made between those state enterprises which are subject to political controls and those which are organized as independent corporate units. Comparable yardsticks are applied to the organization of large private corporations. In Norway, where both bureaucratic and nonbureaucratic forms of state enterprise are represented, the sharp distinction mentioned is usually drawn by private managers as well as other people. For that matter, the head of an autonomous state plant in Norway pointed out that it was just as essential for him as for his private competitors "to have *time* to use commonsense"; that is, to enjoy both independence and relative freedom from routine duties.

4. Private management attitudes toward the government, not unexpectedly, are generally characterized by a desire to keep intervention down—a desire which is often shared by managers of co-operative enterprises and sometimes by officers of labor unions, too, even where their influence upon the government is strong. (The *functional* differences involved were stressed frequently by spokesmen for the Swedish co-operatives, labor, and government, which all favor the same ideological creed.)

The strong emotional, if not fanatic, undertone, however, which is so frequent in American business attitudes on the question of public intervention, is usually missing in the European countries studied. Certain areas of government intervention, even state ownership, are widely regarded as legitimate by private managers. The whole issue of government and business is discussed in Britain and Scandinavia on pragmatic grounds in each case, not as a matter of dogma or a quasi-moral issue of absolute character. The chairman of a large British concern told me that as a Conservative he would have put the nationalization of coal into his program, though it might have been suspect coming from a Conservative. He also approved of the nationalization of electricity and gas, as a device against a "parochial outlook," and he would add water supply. On the other hand, he was emphatically opposed to nationalization or public supervision in his own industry and

most others: "If we were open to investigation of all the silly things we do, we'd never get anywhere. We need authority to make mistakes."

Conversely, a socialist leader in Norway emphasized that his party no longer advocates nationalization or even intervention for its own sake, that they judge each case on its merits, that intervention should be confined to fields where private business fails or is inapplicable (because of war effects or large capital needs, for example), and that even there the trend leads away from centralized planning ("try to regulate the climate; don't try to count the raindrops"). Such attitudes are now fairly frequent in both ideological camps.

5. Delegation and decentralization of responsibilities is widely considered conducive to initiative and risk-taking on the part of individual executives; but top managers tend to emphasize that final decisions are unmistakably reserved for their own uncontestable authority. This again applies to all ownership types of enterprise, with some variations in emphasis or hopefulness. I heard a leading German banker give the following reason in explaining why he had quit the presidency of an important public enterprise: "I like to be with an institution where I can refuse a credit application without having to give a reason." Many public and co-operative managers in each country were no less emphatic in stressing the importance of individual responsibility, decentralization, and delegation of managerial authority. For example, managers of the public electricity and gas boards in Britain were practically unanimous in praising the decentralization in their industries compared with the older, centralized pattern in the nationalized coal industry, while executives of the latter were somewhat defensive on this point.

6. The managerial function as such is, of course, in part associated with the achievement of a profit or surplus for the enterprise; but it is widely perceived as exceeding this goal in many respects, even when the goal is qualified by long-range considerations. Additional elements of the managerial function are seen in striving for a firm financial basis and public standing, assurance of stable employment, up-to-date equipment and possible expansion in the interest of coming generations of managers and owners, and the performance of a public service of one kind or another. Rationalizations undoubtedly occur but the frequency of a broad conception of the managerial function, again with rather limited variation according to ownership, is certainly interesting. A somewhat extreme case was presented by the head of a medium-sized family enterprise in Norway, who is a supporter of Moral Rearmament and sees the real function of management in "helping to make people happy," by creating mutual confidence among all the groups in industry. Thus far, it is true, he has done little about it on the practical level.

The chairman of a large and profitable company in Britain commented as follows: "You have to give people a field in which they feel they can perform; satisfaction comes from *performance*, from fulfilling oneself (assuming the income is adequate). Remuneration *is* weighed in industry—as something to get out of your way as a problem, in order to do the things you are really interested in."

7. Managerial job satisfaction, accordingly, is related only in part to financial achievement in the sense of either profit or individual income. Or,

rather, profit is widely considered the indispensable starting point of managerial job satisfaction, not its true essence. The latter is mostly seen in doing the job itself; that is, in being active, getting things done, fulfilling an assignment, justifying the trust of associates and employees, building an up-to-date and durable structure, being considered successful by others, being respected, doing something useful, meeting a challenge.

The divisional manager in a British nationalized industry introduced himself with the words, "I am a capitalist," and wound up the lengthy interview with the words, "I am a violent antisocialist." But in between, he explained elaborately why he had quit his prosperous business in the same industry, why he had accepted the government job (after first heading a committee against nationalization), and why he opposed current schemes of denationalization as impairing efficiency (interestingly, he slipped once in referring to his government board as "my company"). His reason for accepting and carrying out the assignment, despite hostility to nationalization in general, was that he welcomed the opportunity to prove that he could handle a very big job. He was now proud of his financial and organizational achievement and enjoyed thoroughly the importance of his job. Moreover, he loved this particular industry which, he said, was "in his blood," and was going to remain loyal to the job still to be done in it, regardless of ownership.

Another element of managerial satisfaction was exemplified by the head of a medium-sized family enterprise in the British Midlands, who emphasized that aside from the balance sheet, the reputation of the company in the town mattered very much: "We all belong here. We were brought up that way."

8. Human relations of a desirable type rank high in the scale of managerial satisfactions. Distinct traces of paternalist attitudes can still be found, especially in older managers and in family-type enterprises. In fact, the family background or history of certain enterprises—including some very large ones—is often considered an asset. At the same time, the importance of good communication of the give-and-take type is now widely recognized. Various types of joint consultative committees are being tested in all of the countries mentioned. On the other hand, direct participation of employee representatives in managerial decision making has thus far been attempted only in the German steel and coal industries and is quite controversial there at this point.

The director of a German employers' association felt that "every employer has the shop council he deserves" and that there is something to be said for "the workers sharing the employer's worries." However, he also felt that the codetermination scheme went much too far in encroaching on property rights, in bringing alien elements into each enterprise, and in confusing the accustomed dividing lines between unions and management. This last point was virtually confirmed by some labor representatives, too. However, the *Arbeitsdirektor*—one of those strange new hybrids who are approved by the unions but are part of top management—in a large private enterprise pointed to the loosening up of industrial relations under this

act: "People remain in permanent conversation now; those old terms exploiter and agitator are no longer used; the employees now feel that they are no longer at the mercy of an inscrutable management." In the three other countries, however, I found very little interest on the part of either labor or management in any comparable scheme for codetermination, though joint consultation was endorsed, in varying forms and degrees of enthusiasm, by the majority of those interviewed.

9. Varying national and cultural traits appear to be of considerable significance in explaining managerial attitudes in each country, especially the attitudes toward employees and their organizations. Where the population has come to believe generally in persuasion and co-operation—often after a stormy industrial history—management interprets its social role and executive leadership function with restraint, and labor reacts accordingly. Despite outward similarity of the technical forms of industrial management, therefore, the actual attitudes and behavior patterns of both management and labor vary considerably according to the general value system of the population concerned.

A few of the executives interviewed, it is true, saw little difference between managerial problems of the various countries, but most of those who had had first-hand experience abroad took a different view. The head of a Swedish bank felt that most Swedish businessmen would be considered radical socialists in the United States. A Norwegian industrialist who is familiar with Germany contrasted the German readiness to be disciplined with the Norwegian desire to be told "why" and to be held in esteem. The chairman of a large British concern with international links thought the national differences in the way in which one gets co-operation to be most significant even when the forms of industrial organization are similar. He claimed that in the experience of his company in France, for instance, "no rules were possible," but that significant differences also existed within Britain; for example, between the courteous ways of both managers and employees in the Midlands and the intensely emotional reactions of their colleagues in Wales.

Systematic testing of the tentative results and hypotheses that were just presented and illustrated, with possible quantification of the additional data to be secured, would seem to be very promising. Such a study would require the prolonged co-operation of research institutes in every country to be included. More areas with diversified types of enterprise ownership should be added to the sample. In such co-operation, American participation could provide methodological leadership as well as a co-ordinating influence. The international exploration and comparison of the various determinants of managerial attitudes could put greater realism into the continuing debate on the merits and trends of economic institutions.

W. W. Cooper: The requirement of reviewing two papers within the limited time allotted to a discussant makes it desirable to confine attention to a few selected points from the many covered in these papers. So far as

possible, both papers will be discussed simultaneously and my own comments introduced as seems appropriate. I shall then conclude with some general observations and suggestions.

At the outset it may be well to qualify my remarks by noting that both papers apparently represent only parts of larger pieces of work to which I have not had access. It may be helpful, also, if I note that a fair assessment of these papers requires a rather broad view of economics as the science which is concerned with describing, predicting, assessing, and prescribing methods for changing economic institutions; i.e., institutions which are viewed as being primarily devoted to organizing and allocating scarce resources. Furthermore, these institutions need to be considered in both their formal and informal aspects.

Both papers are concerned with new directions for research in economics and both draw from "alien" disciplines. Drawing on the literature of business and administration Mrs. Penrose seeks to incorporate into economic theory the processes of entrepreneurial (or quasi-entrepreneurial) recruitment that firms have available. By this means she seeks to explain the growth of firms (over time) as well as limits to their size at any point of time. Mr. Hickman proposes to study managerial motivation by drawing on the constructs of sociology, psychology, applied anthropology, and related fields. In particular, he seeks to provide an empirical basis for establishing the range and relative importance of various managerial motivations, including profit maximization.

This general statement of their objectives already provides an example of important differences in the approaches of the two authors. Mr. Hickman's approach is empirical; Mrs. Penrose's is theoretical. This remark requires elaboration in order to avoid possible misinterpretations. Mrs. Penrose, in the traditional manner of economists, poses her problem in the context of certain large "facts" which appear to demand explanation: The fact in question is that firms at any particular point in time are clearly limited in their size and yet these firms by various devices which are evolved by themselves or others—e.g., training of a larger managerial class and development of new devices for recruitment, co-ordination, etc.—are enabled to grow beyond these limits at subsequent times. Her formulation can, at least conceptually, lead to empirical validation and reformulation The important point is that her approach, even though resting in part on alien disciplines, seeks to provide a basis for systematic synthesis and change of the existing body of economic doctrine or theory.

Mr. Hickman does not take his facts for granted -other than some obviously inadequate and perhaps unguarded methodological statements culled from certain economic texts. He proposes to begin by collecting the necessary facts. Moreover, his approach rests squarely on the methods and knowledge of the disciplines he proposes to use. His paper does not make clear how either these methods or knowledge, or indeed his own findings, will be systematically used to synchronize with or to alter the existing discipline of economics. It is possible, of course, that this question is premature (or that it has been answered elsewhere), or that Mr. Hickman will be content with the cumulation of a body of factual information which he feels is

important in its own right. The task of assessment would have been facilitated if he had clarified the status of this matter.

Both papers promise an access to new problem material which is welcome in an area of economics which has not provided an adequate bridge for this purpose. An adequate bridge would, I believe, provide for two-way traffic. It would not only enable economists to move across it in search of the facts that their theory (or motivation) seems to require, but would also enable the world of economic institutions to bring to economics the kinds of problems which ought to be occupying our attention in the quest for new knowledge (and new light on old knowledge). The kinds of interrelations and communications that have now been achieved between governments and economics at the macro level might prove equally fruitful in the area that deals with the business firm at the micro level.

Of the two papers presented here, Mrs. Penrose's seems to offer the most promise in this direction. This may seem strange in view of the fact that her paper appears to be much more closely aligned with traditional economic formulations. Indeed her propositions can be regarded as rather simple extensions of the observations of Kaldor, Chamberlin, and others on the status of the entrepreneur as a fixed factor guaranteeing the ultimate appearance of diminishing returns to limit the size of firms. There is a difference, however, which may emerge more strongly in subsequent work. To explain the existence of these limits and, simultaneously, to explain growth beyond these limits, Mrs. Penrose has adopted the expedient of splitting the entrepreneur into a variety of planning agents. By this means she is able to fix the amount of entrepreneurship that the firm has available at any point in time and allow it to grow over time. This represents a step away from the traditional viewpoint wherein the business firm is treated as an elementary economic unit composed of an entrepreneur and selected factors of production This simple entrepreneur-factor model of the firm as an organization is adopted for economic analysis, not, it may be argued, because economists are unaware that it is oversimplified for individual firm analysis, but because it is adequate for purposes of industry and general social analysis. I believe that this argument is subject to serious qualification in many respects. It leaves many questions unasked and unanswered. It also seriously hampers our ability to test many fundamental economic presuppositions.

In any event, Mrs. Penrose has taken, I believe, a step toward repairing the deficiency. Efforts to push further in this direction will, I think, lead inevitably toward analysis of the structure of business firms as a means of explaining their behavior. The difference in approach that I am attempting to portray may, perhaps, most easily be understood by reference to regarding the atom and the cell as the elementary units for analysis of matter and living organisms in contrast to regarding them as units with a structure and organization which require representation both in their own right and as part of the general study of physics and biology. By further movement in this direction we may secure a more adequate model of business firms which will assist in building the kind of bridge previously referred to. This may add to the layer of "aggregation problems" that economics now confronts but

it need not divert it from the task of social analysis—any more than modern physics has been diverted from the task of explaining physical behavior or any more than biology has been diverted from the task of explaining the behavior of organisms. In many cases our units, the firms, are so gigantic (or occupy such positions) that an adequate explanation of their behavior will suffice for an explanation of industry behavior as well. In other cases the devices of "representativeness" can be employed to advantage. Techniques of stratification and clustering can also be used if required.

It seems to me that Mr. Hickman is moving in a different direction. Unless he is willing to make rather strong assumptions which would equate managerial motivation and business firm behavior, his proposed agenda of discovery, even if successful, will not necessarily provide us with adequate descriptions, predictions, or assessments of these economic institutions. Failing these assumptions (and their validation), his analysis can provide us only with a means for gaining insight into the opinions, utterances, and behavior of a managerial "class." This is not to say that his analysis will be irrelevant to business firm behavior even in this extreme. Such class behavior might by a circuitous route—e.g., through its effects on government, public opinion, or the behavior and opinion of subordinates, union officials, etc.—affect the behavior of business firms. The point I am seeking to make is not that Mr. Hickman's findings will be valueless but that underlying his seemingly radical proposals is a model of the business firm which is of the same kind as the traditional economic version—an organization in which entrepreneurs, managers, or some dominant group of managers manifest their wishes and the firm behaves accordingly. For example, the entrepreneur "selects" an optimum transformation or cost function because he wishes to maximize profits. A study of the literature of standard costing or cost accounting practice will reveal that this is not the case. (See, e.g., James L. Dohr and Howell A. Ingraham, *Cost Accounting Principles and Practices* [New York: Ronald Press, 1946], Chapter 28.) Optimum costs, even when known, are regarded as undesirable bases for guiding and controlling behavior. Organizational (and psychological) considerations arising from the systems of delegation and control employed by modern business enterprise enter into these optimality rules in a way which is not comprehended by the traditional economic model of the firm. I might add that these considerations also enter into the methods of cost record keeping and estimation in a way which may make the resulting costs unsuitable from the standpoint of traditional economic analysis, even though essential to survival and maintenance of the firm as an organization.

Both papers invite far more attention than can be devoted to them here. Both are incomplete, imprecise, unclear, and unbalanced. But this criticism needs to be interpreted in the perspective of what the papers being reviewed are attempting to achieve. It is unfair, and perhaps dangerous, to demand such perfection and clarity from papers which constitute pioneering efforts in new directions as might be demanded from papers which restrict themselves to areas which have already been explored and partially settled.

Although she utilizes much of the traditional apparatus of economics in the form of indivisibilities, idle capacity (overhead) costs, etc., Mrs. Penrose's

model can also be represented by the differential equations of biological growth. (*Vide* V. A. Kostitzin, *Mathematical Biology* [London: Harrap and Co., Ltd.].) By splitting the enterpreneur into groups of planning agents, however, she has begun to introduce something which is to be found neither in traditional biological growth models nor in traditional economics. A further step consists of introducing hierarchical arrays of such agents as the common method for effecting recruitment and securing integration and control. She can avoid some of the difficult and tortured translation of traditional definitions and categories of cost to be found in her paper, I believe, by recognizing explicitly that she has departed from the model which gave them their original meaning. This is implicit, for example, in her description of planning "agents" as unused "factors"—as unused or wasted resources from the standpoint of operations, even though perhaps fully utilized from the standpoint of planning for future activities. J. M. Clark's concept of idle capacity and overhead cost does not sit any more gracefully and easily in this context than does E. A. G. Robinson's concept of "unbalanced additions." Nor is the problem resolved by reference to long- and short-run costs and profit maximization.

The distinction between planning and operations drawn by Mrs. Penrose is a real and significant one. I believe that she can more fruitfully proceed by maintaining this distinction than by assuming that planning agents become operating agents when their plans are put into effect. Preserving these distinctions will require introducing what Professor H. A. Simon (*Administrative Behavior* [Macmillan, 1948], page 9) calls "vertical" specialization into the model of the firm as well as the "horizontal" specialization which is envisioned in the usual process of labeling variables in the production function. A really good planning agent is likely to remain in the planning hierarchy (in a so-called "staff" capacity) rather than become an operating agent (in the so-called "line" organization) even when his plans are adopted. For concreteness, one might think of an operating agent in terms of the usual production foreman and a planning agent in terms of the usual industrial engineer (standard setter) or budget officer.

By introducing a hierarchical array of planning agents Mrs. Penrose will have introduced a new array of problems (e.g., the phenomenon of agent promotion within the hierarchy) into economics. As she correctly notes, this will also help throw new light on old problems as well; e.g., the problem of handling uncertainty at various levels of entrepreneurship or quasi-entrepreneurship within the firm over time. (It is for this reason that I have persistently referred to these persons as agents to designate a category lying between the traditional entrepreneur and factors of production.) The addition of another hierarchy of operating agents will add still further elements of richness. In particular, it will expose the problems of co-ordination and control that are most easily thought of in terms of still a third hierarchy of agents—a group that may be thought of as control agents (e.g., accountants). The systems of internal control maintained by such personnel are designed and maintained for this purpose within the context of the delegations made within and between the other two hierarchies.

A moment's reflection on these arrays will reveal, I believe, why the ac-

counting system must be maintained in terms of the documented historical cost record of the accountant rather than the undocumented opportunity costs of traditional economics. Control may be visualized as the process of securing conformance between plans and actions—a process, it should be noted, which may require adjusting plans to actions as well as the reverse. (See E. L. Kohler, *A Dictionary for Accountants* [Prentice-Hall, 1952], page 108.) Clearly it is as undesirable to allow industrial engineers (planning agents) to set arbitrary standards of performance as it is to allow production superintendents (operating agents) to behave arbitrarily with respect to these standards. This is the nub of the problem of internal control and system design as visualized in accounting, especially if one views it in the context of a system of authority delegations which makes it desirable to minimize upper level intervention in operations and plans. Efficiency can then be viewed in terms of the levels at which the controls operate (e.g., costs and volumes) as against possible alternatives. Opportunity cost thus may become an ancillary device for the accountant although a primary device for operating and planning agents.

Models constructed along these lines will, I believe, provide more adequate bases for understanding, predicting, and assessing the behavior of individual business firms engaged in allocating scarce resources. They will, of themselves, suggest new problems and methods of attack. Perhaps even more important, such models and studies should contribute toward building a more adequate bridge between economics and business firms.

I am afraid that I have few suggestions to make in connection with Mr Hickman's paper. A good deal depends on whether one agrees with his optimistic assessment of the state of the knowledge and the methods of the sciences on which he proposes to draw. I do not feel wholly qualified to render a judgment on this although, in common with many other economists, I have myself been disappointed in past attempts to draw on these disciplines I remain to be persuaded, however, that we will be able to use these techniques without a good deal of selection and adaptation, although I should hasten to add that I feel the same way about techniques drawn from other fields as well. (That this is true even in such purely methodological fields as statistics has been made clear by recent work of the Cowles Commission and others in relation to problems of structural estimation and identification.) For example, what I am told are Professor Linton's applied anthropological constructs of status and role may be suitable approximations for analyzing an informally organized society. It is by no means clear that they will prove equally useful in discussing entities, such as business firms, which have important elements for formal organization as well. Lazarsfeld, Newcomb, and others may have reported some success in applying these constructs to studies of the American soldier in a military organization which does have important formal aspects. But it should be realized that the relative permanence of status designations in such a military organization may be misleading in studying (competing) business organizations. Perhaps a more apt analogy is in terms of a play being put together and operated by a director who retains the right to edit the script and change both status and roles in the light of his judgment of

the actor potentials at his disposal and possible competing plays which are (or will be) produced at the same time.

I have already indicated my uncertainty as to how Mr. Hickman proposes to translate his findings (and methods) into the institutional entities with which managers, qua managers, are concerned. Perhaps by beginning with already available data, such as the Commerce Department-SEC series on plant expenditures, he could effect such a translation. The types of methods he employs in terms of self-theory (self-directed depth interviews, content analysis, etc.) are likely to prove quite expensive even if he restricts his attention to such ongoing series. If he proposes, instead, to employ himself in studying motivations, aspirations, etc., of a managerial class, the task is likely to take on truly forbidding proportions. Even modern sampling methods would require huge numbers to achieve any degree of representativeness from some five million firms of varying sizes scattered over a multiplicity of industries and regions—and status, self, and role are likely to vary to some extent with each of these properties. Of course, he may restrict his studies to a handful of firms and managers. He would then face, it seems to me, a rather difficult problem of generalizing his findings concerning the relative importance of different kinds of motivation in a form which would command the confidence and respect of others. Such empirically oriented studies as he proposes would require this kind of confidence and respect if they are to have the effects he indicates.

I am afraid that I can do little more than point out these possible pitfalls to Mr. Hickman. One way to circumvent some of them would involve the construction of adequate models utilizing, at least tentatively, the kinds of findings that Mr. Hickman might conceivably envision as an end product of his studies. Such a course would involve some degree of change in emphasis and timing in Mr. Hickman's proposed agenda. In any event I have already devoted sufficient attention to suitable models of the business firm in my comments on the paper by Mrs. Penrose

PRICE AND WAGE FLEXIBILITY

ECONOMIC CONCENTRATION AND DEPRESSION PRICE RIGIDITY

By JOHN M. BLAIR
Federal Trade Commission

On January 17, 1935, the Seventy-fourth Congress of the United States issued Senate Document No. 13, *Industrial Prices and Their Relative Inflexibility*, thereby touching off what became one of the most vigorous controversies in recent economic literature. On one side of the issue was Gardiner C. Means, who, as Economic Adviser to the Secretary of Agriculture, had prepared the document which was then, in his words, "commandeered" by the Senate. With him were Ralph C. Wood and, at the time, J. Kenneth Galbraith. On the other side was a more numerous host, including Willard Thorp, Rufus Tucker, Jules Backman, Edward S. Mason, Don D. Humphrey, Alfred Neal, Ernest Doblin, and others. Following the publication of the Senate Document, the controversy progressed from general arguments in the economic journals to elaborate statistical works, the most ambitious of which were prepared by Means, Thorp, and Neal. The outbreak of World War II had the effect of severing the strands of argument, and since that time the whole controversy has remained more or less in a state of limbo.

The controversy ranged over a number of economic issues, only one of which—the relationship between economic concentration and price flexibility—will be discussed in this paper. Among the issues which will not be examined are the economic effects of price rigidity, the relationship between price and production behavior, the history of price rigidity, the various statistical measures of price change, the adequacy of the data used to measure price behavior, etc. Obviously, each of these topics could, in itself, provide the subject for one or more papers. And even on the one topic to which this paper is limited, time does not permit a discussion of the general and theoretical arguments offered in the controversy.

The principal evidence was offered by Gardiner C. Means on the one side and by Willard Thorp and Alfred C. Neal on the other.[1] Putting

[1] National Resources Committee, *The Structure of the American Economy*, prepared under the direction of Gardiner C. Means, Pt I, 1939, p 142; Temporary National Economic Committee, Monograph No 27, *The Structure of Industry*, by Willard Thorp and Walter Crowder, 1941, p 357; Alfred C. Neal, *Industrial Concentration and Price Inflexibility* (American Council on Public Affairs, 1942), pp. 91, 92, and 118

it briefly, Means found that an inverse relationship between the level of concentration and the amplitude of price change did exist. Thorp found that it did not. In Thorp's view, differences in behavior were associated not with differences in concentration but with differences in the characteristics of the product. Neal found that "price change is closely associated with direct cost change and is not due to concentration."

Means's analysis has been criticized on the grounds that the price data which he employed, the BLS wholesale price series, do not reflect hidden or secret discounts. Thorp's study is subject to criticism on two grounds: that he employed no standards, as did Means, to eliminate products which are not meaningful for this type of analysis, and that the price data which he used—the census realized prices—may fluctuate merely because of a change in the relative importance, or "weights," of the various individual products within a census product class. Neal's study, which is also based on census data, is open to the same objection, plus the additional criticism that his analysis assumes that during a downswing an industry's direct costs remain proportional to the average weighted price of its products. According to Neal, it is reasonable to assume that during the Great Depression a shift from high-priced to low-priced goods within an industry "would be reflected in the average direct cost index also"—and reflected in the same degree and extent!

What is offered here is a new approach which will bypass some of the more important limitations inherent in the previous studies. Each of these previous studies involves comparisons of different products with varying degrees of concentration. But, as was pointed out during the course of the controversy, products may differ from each other, not only with respect to concentration, but they may also vary with respect to such other factors as elasticity of demand, cost behavior, and adequacy of price data, each of which has been cited as an explanation for the appearance of price rigidity. If instead of comparing different products the same product is examined during two depressions, the effect of these other variables can largely be isolated, since it need then only be assumed that, as between the two depressions, they were affected by no significant change.

Although the Great Depression of 1929-33 obviously suggests itself as the later period to be used in such a comparison, there remains the problem of finding a depression which antedates—though not too greatly—the emergence of high levels of concentration. This problem is aggravated by the fact that in many American industries concentration has been high since around the turn of the century. It happens, though, that immediately prior to the great consolidation movement of 1897-1903 this country experienced a rather severe depression, begin-

ning in 1890 and lasting for several years.[2] In this study 1897 has been selected as the terminal year, since, like 1933, it appears to be a year in which the deflationary forces finally exhausted themselves. Although the depression of 1890-97 was a serious one, no depression in American history has approached in severity the depression of 1929-33. Thus, all other things being equal, a showing of equal flexibility is not to be anticipated since prices would be expected to decline less in the earlier than in the later depression; a showing of greater flexibility in the earlier period would be all the more remarkable.

The price data used in this analysis are the wholesale price series of the Bureau of Labor Statistics. In most cases the description of the product is virtually the same in both periods, although this is not an essential requirement. Price series covering both depressions are available from the Bureau of Labor Statistics for 168 commodities, of which 122 are used in this analysis.[3]

The first step in the analysis is to show the price changes for products which, by and large, were atomistic areas in both depressions. If Means's argument is correct, such products would be expected to show no significant change in price behavior; they certainly would not be expected to show any decrease in their flexibility. Chart I shows

[2] According to the long-term index of "American Business Activity," prepared by the Cleveland Trust Co., the general period was one of depressed economic conditions, with a downswing in 1893 and 1894 ("Panic of 1893"), followed by a very brief upturn ("Recovery of 1895"), which was in turn followed by another downswing of about equal severity in 1896 and 1897 ("Silver Campaign Depression"). Warren and Pearson's long-term index of physical production shows a decided dip ending in 1895, followed by a lesser downturn in the next two years To the extent that price trends can be assumed to mirror the general state of economic conditions, the available information would suggest that the low point was not reached until 1896 or 1897 The all-commodity wholesale price index of the Bureau of Labor Statistics (with 1913 at the base of 100) declined from a level of 80.5 in 1890 to 66 7 in 1896, rising by only a tenth of a percentage point, to 66.8, in 1897. The majority of the individual commodity groups did not reach their low point until 1897. In describing the period, the Commissioner of Corporations used such terms as "depressed conditions," "commercial depression," "slack demand," "acute depression," etc. (*Report of the Commissioner of Corporations on the Steel Industry*, Pt. I, 1911, pp. 63, 72, 75)

[3] The products for which price series are available but which are not included in this analysis fall into the following groups: fabricated metal products (17 items); chemicals (12 items); stone, clay, and glass, other than plate and window glass (8 items); petroleum and coal other than anthracite (5 items); nonferrous metals other than copper, lead and zinc (3 items) and miscellaneous products (1 item). The 17 fabricated metal products consist of simple hand tools and fixtures (e.g., saws, axes, chisels, doorknobs, etc.) which are relatively unimportant items and for which information on concentration in the earlier depression is lacking. The chemical and drug items were omitted because of the conspicuous unreliability of the BLS price series for this particular group. The stone, clay, and glass products were omitted because information on long-term changes in concentration is unavailable; this is particularly true of products sold on a regional or local basis within which significant changes in concentration may have taken place Price series during both depressions were available for only two petroleum products, Pennsylvania crude oil—which is hardly representative of crude oil production—and kerosene—which by 1933 had nearly passed into economic oblivion. In addition to copper, lead, and zinc, price series were available for only three other nonferrous metals—quicksilver, tin, and silver—the prices of which are largely determined by developments abroad or by monetary policy.

COMPARISON OF PRICE FLEXIBILITY IN TWO DEPRESSIONS
1890-97 AND 1929-33

FARM PRODUCTS AND FOODS

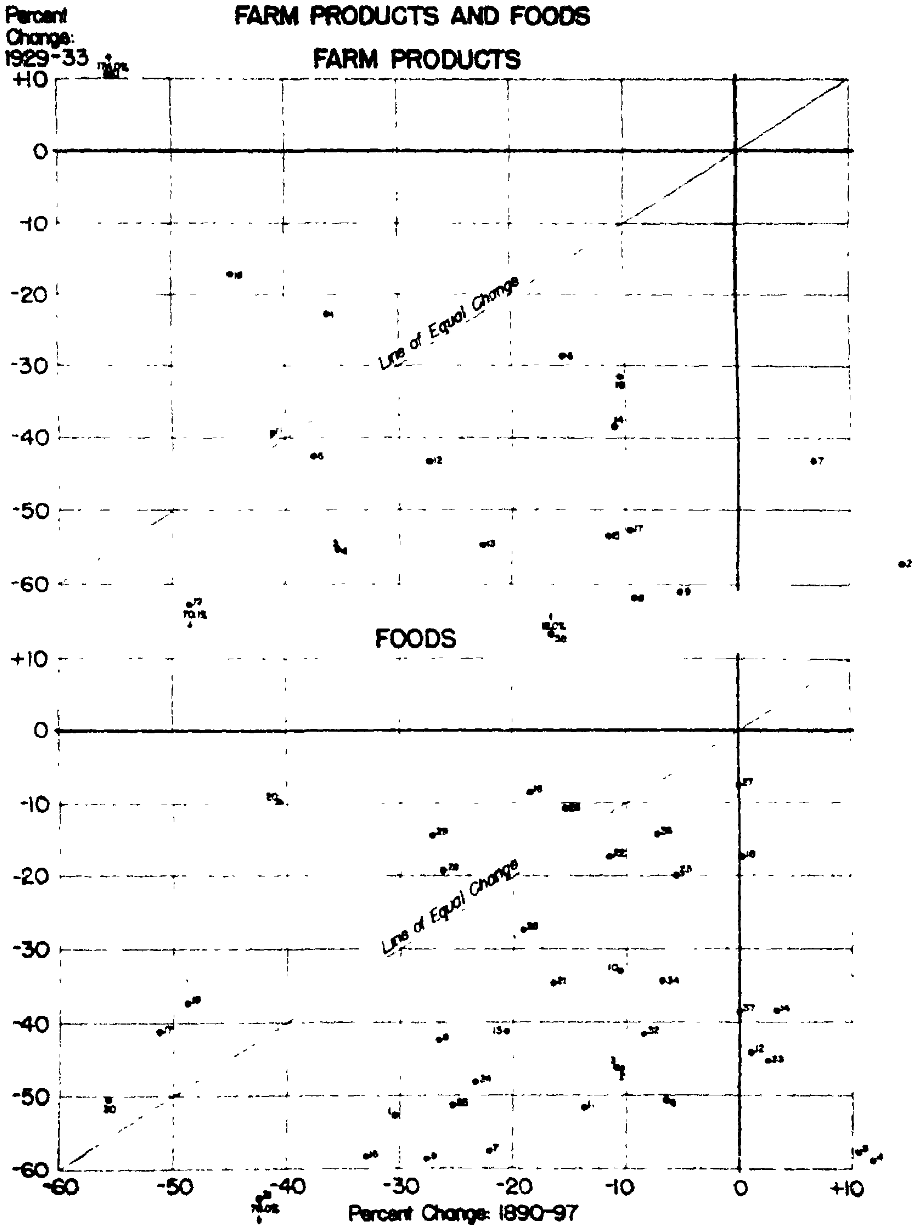


CHART I

the price changes in 1890-97 and 1929-33 for farm products in the upper grid and foods in the lower. Each grid is bisected by a line of equal change. Products falling below and to the right of the line had greater price declines in the later than in the earlier depression, with the reverse being true of products falling above and to the left of the line. As will be noted, most of the farm products fall below and to the right of the line; i.e., they showed greater flexibility in the 1929-33 depression than in the earlier period, as would be expected in view of the greater severity of the later depression. This was true of all but 4 of the 19 farm products for which price data are available. The exceptions are potatoes (18), oats (11), barley (1) and hops (10). The change in flexibility of the latter two is largely explained by the unusual circumstance of the repeal of Prohibition; thus the price of hops, which declined by 56 per cent during 1890-97, rose by 174 per cent during 1929-33.

Food products present much the same pattern. Of the 38 items for which price series are available, all but 9 showed greater flexibility in the later depression. The exceptions are three types of dried fruit—dried apples (17), prunes (19), and raisins (20); one type of canned fish—canned salmon (16); and five other processed products—salt (38), soda crackers (26), molasses (28), granulated sugar (29) and coffee (30). Some of these exceptions are worthy of comment.

In the salmon industry, only two of the half a dozen leaders were in existence at the time of the 1890-97 depression. Pacific American Fisheries, Inc., the largest fisher and canner of salmon in the world, did not come into existence until 1902 when, under the name of Pacific Packing and Navigation Company, it was organized "as a consolidation of some sixteen concerns located on Puget Sound and the coast of Alaska engaged in the business of catching and canning salmon." (*Moody's Manual* [1904], page 1516.) Three of the other principal enterprises were not formed until the twenties. By the time of the later depression, the industry was fairly well centralized, with eight companies in 1934 producing more than half and two companies more than a quarter of the output. Moreover, there appear to be both price leadership and a high degree of price uniformity in the industry.[4]

[4] "Although no cooperation or agreement has been proved to exist among the canners, there has been great uniformity in the opening prices [at which about 90 per cent of the pack is sold] since 1905; nearly all canners follow the prices of one or two large companies, and refuse to quote prices until those of the large firms have been announced The Alaska Packers Association has taken the lead in declaring the prices of all grades except one and its prices have been followed by nearly all the other canners in declaring their prices. . . Both the uniformity of the prices declared and the uniformity of time of declaration suggest that the prices of one or two leading firms are used as a guide." (Arthur R Burns, *The Decline of Competition* [McGraw-Hill, 1936], p 139)

The same general type of situation applies to the salt industry. In that field the two leading companies—International Salt Company and the Morton Salt Company—were not formed until after 1897. The former, which now produces about 25 per cent of the industry's output (*Standard & Poor's Corporation Records*, December 8, 1949, page C-2-5), was organized in 1901, acquiring in the next four years the capital stock of eleven independent firms. Similarly, the latter was not formed until 1922, when it was organized as a successor to a line of companies originating in Chicago during the mid-nineteenth century.

In the soda cracker industry, neither the National Biscuit Company nor the Loose-Wiles Company were in existence at the time of the earlier depression, the former having been organized in 1898 and the latter in 1912. According to *Moody's Manual* of 1901: "National Biscuit Co. was incorporated under the laws of New Jersey, Feb. 3, 1898, for the purpose of carrying out a plan to purchase the principal cracker manufactories in the United States. . . . The company owns many baking plants and controls the greater part of the trade in this line east of the Rocky Mountains." (Page 985.) In 1901, it owned fifteen plants. By 1935, National Biscuit and Loose-Wiles, together with United Biscuit Company, sold 74 per cent of the biscuits and crackers produced by the more than 330 American baking establishments, with National Biscuit Company accounting for approximately 42 per cent. (Federal Trade Commission, *Agricultural Income Inquiry*, Part 3, 1938, page 41.) According to the Federal Trade Commission: "In the cracker industry it is stated that manufacturers must and do follow the lead set by the National Biscuit Co. and Loose-Wiles." (*Report on Open Price Trade Associations*, 1929, page 78.) Likewise, the two principal producers of molasses—the American Molasses Company and Pennick & Ford, Ltd.—were not organized until after 1897. The American Molasses Company was incorporated in 1905 as a consolidation of two formerly independent firms: N. W. Taussig Company and Eastern Refining Company. Pennick & Ford, as originally constructed, was not organized until 1898. It was not until 1920 that it was consolidated with the Douglas Company, another important producer, which had been organized in 1903.

Chart II shows the price behavior in both depressions for two other atomistic areas: textiles and lumber. In both, the scatters resemble those of farm products and foods. Two-thirds of the thirty textile products showed greater flexibility in the later depression. Half of the exceptions consisted of one type of commodity: wool products. Similarly, in all but two of the thirteen lumber and wool products price flexibility was greater in the 1929-33 period; the exceptions are bed-

COMPARISON OF PRICE FLEXIBILITY IN TWO DEPRESSIONS 1890-97 AND 1929-33

TEXTILES AND RELATED PRODUCTS and LUMBER AND WOOD PRODUCTS

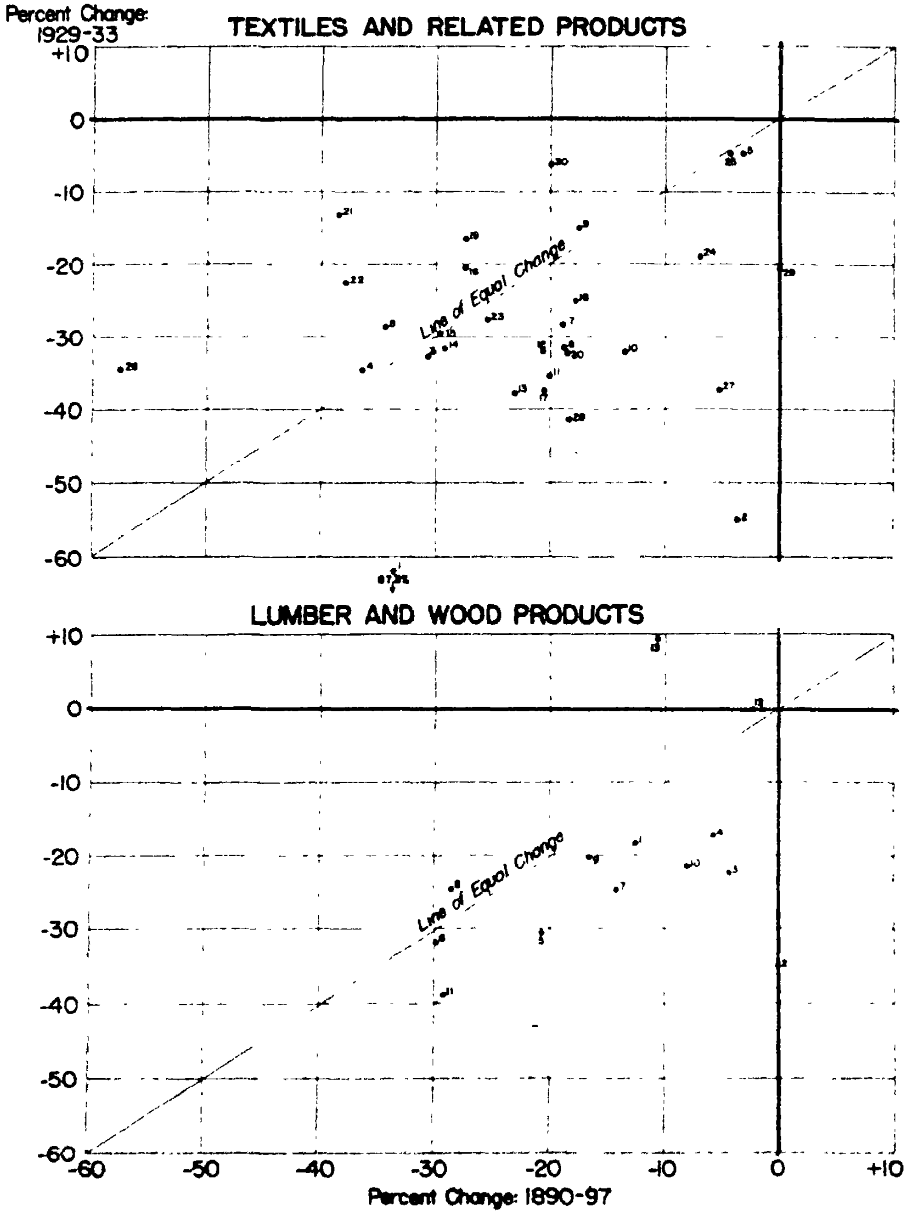


CHART II

room chairs (12) and matches (13), the latter of which is worthy of note.

While the Diamond Match Company was formed ten years before the beginning of the 1890-97 depression, it was not until 1901 that it entered into an agreement with the British firm, Bryant & May, Ltd., under which the latter agreed "to refrain from manufacturing or selling matches in North America." And it was not until 1903 that it entered into a similar agreement with the Swedish Match Company, under which the latter "agreed not to manufacture matches in the United States except by arrangement with Diamond Match Co."[5] Inasmuch as the safety match had been a foreign development and sales by foreign companies had been an important factor in the domestic market, it was not until these cartel agreements were made that the domestic market could be said to have been controlled. But during the 1929-33 depression, the Diamond Match Company exercised unquestioned control over the domestic market, not only through its position as the leading producer, but also through its holdings in other match companies. In 1939 the stockholders of the Diamond Match Company owned the shares of the Ohio, Lion, Universal, Federal, and West Virginia match companies. Diamond's president held 51 per cent and Diamond itself held the other 49 per cent of the stock of the Berst-Forster-Dixfield Company. These seven concerns, together, produced nine-tenths of the nation's output of matches. (Clair Wilcox, *Competition and Monopoly in American Industry* [TNEC Monograph 21, 1941], page 191.)

Apart from these exceptions, however, the general pattern in each of these four atomistic areas—farm products, foods, textiles and lumber—is the same. As would be expected from the unmatched severity of the Great Depression, prices tended to drop more in 1929-33 than in 1890-97. Against this background, the distribution of price changes in the steel industry becomes of special interest. Chart III shows the price changes in both depressions for nine iron and steel products.

As will be noted, the pattern is the reverse of that of the atomistic areas. With one exception, hot-rolled sheets (7), the observations fall above and to the left of the line of equal change; i.e., prices dropped less in the later than in the earlier depression. Findings pointing to the same conclusion were reached by Abraham Berglund in his study of price behavior before and after the formation of the U.S. Steel Corporation (specifically in 1898 as compared to 1902-14) and by George

[5] Report of the Commissioner, Combines Investigation Act, Department of Justice, Ottawa, Canada, *Investigation into an Alleged Combine in the Manufacture, Distribution and Sale of Matches*, December 27, 1949, p 7.

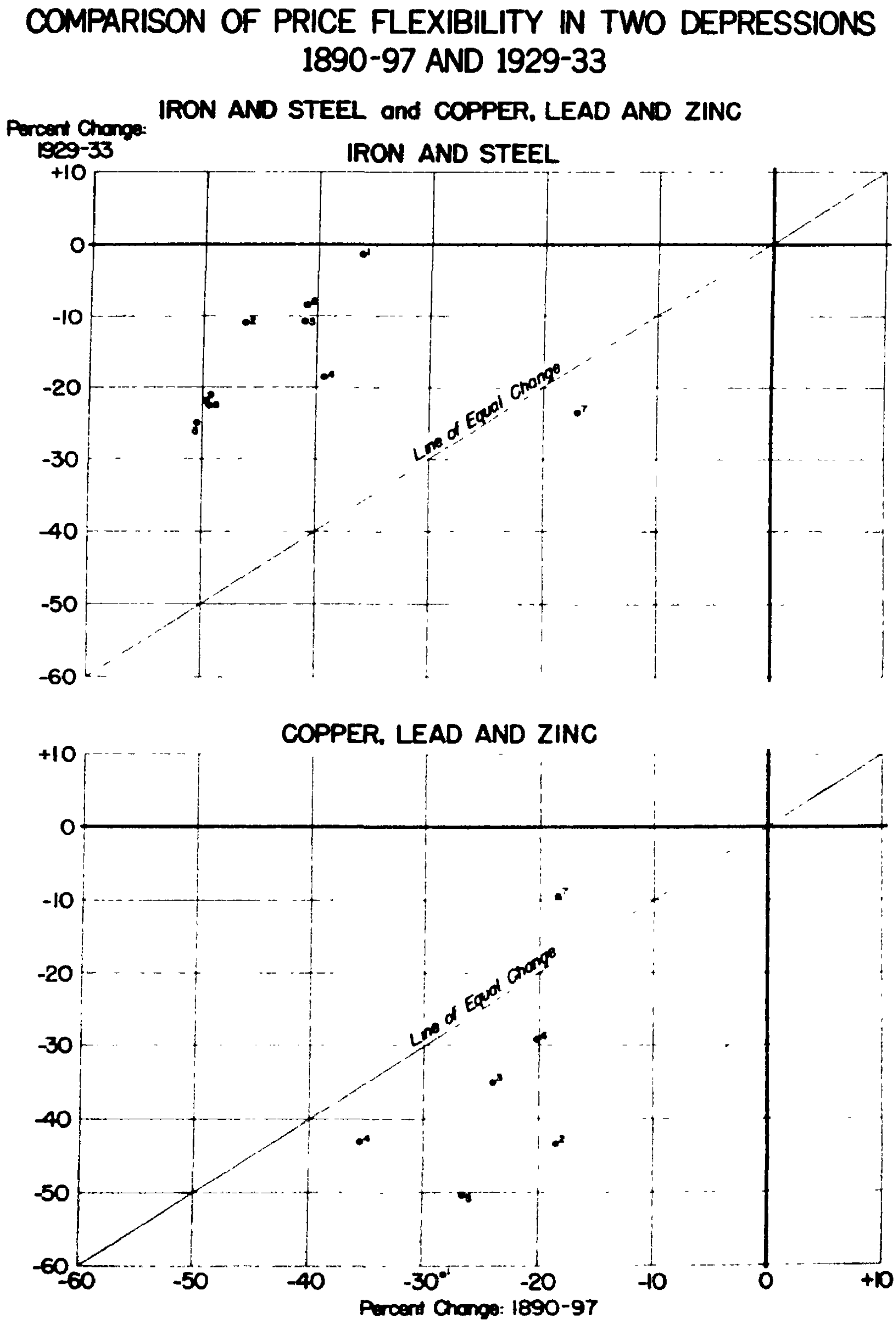

COMPARISON OF PRICE FLEXIBILITY IN TWO DEPRESSIONS
1890-97 AND 1929-33
IRON AND STEEL and COPPER, LEAD AND ZINC
Percent Change: 1929-33
IRON AND STEEL
+10
0
-10
-20
-30
-40
-50
-60
Line of Equal Change
COPPER, LEAD AND ZINC
+10
0
-10
-20
-30
-40
-50
-60
Line of Equal Change
-60
-50
-40
-30
-20
-10
0
+10
Percent Change: 1890-97

CHART III

Stigler in his comparison of the actual to the total possible number of price changes during 1898-99 as contrasted to 1939-40.[6]

Measured on any basis, concentration in the steel industry during 1929-33, while lower than in the years immediately following the formation of the U.S. Steel Corporation, was far higher than in 1890-97. The Commissioner of Corporations[7] states: "In 1890 there were scarcely any consolidations of the modern type in the steel industry. [The industry] was characterized by the competition of a large number of independent concerns." The only area in which concentration was at all noticeable was in the simpler and heavier forms of steel. But even here it took seven companies to account for half of the output, as represented by steel ingot production. According to the commissioner: "These concerns were . . . distinct entities with respect to ownership. . . ." (*Ibid.*, page 65.) In 1937 only four companies accounted for 71.7 per cent of the value of product of open-hearth and Bessemer steel. (TNEC Monograph No. 27, *op. cit.*, page 463.)

Not only was the industry in the earlier depression composed of a "large number of independent concerns"; vertical integration was generally conspicuous by its absence. The Commissioner of Corporations states: "Thus, the production of ore, broadly speaking, was a business by itself, and comparatively few iron and steel companies had extensive holdings of ore lands. . . . Moreover, a substantial proportion of the country's pig iron was produced by 'merchant' furnaces, which sold their product instead of manufacturing it into more finished articles. Even the larger manufacturers of steel bought considerable quantities of pig iron. . . most manufacturers of finished articles purchased their supply of semifinished steel instead of producing it." (*Report of the Commissioner of Corporations, op. cit.*, page 66.)

It is true that during the 1890-97 period the steel companies made repeated attempts to control the market through pools and gentlemen's agreements. But it is also true that these loose forms of control proved to be relatively ineffective, tending to disintegrate whenever demand began to fall off. Vernon Mund writes: "During the recession of 1896-97, all of the variously reported pools and price associations appear to have collapsed and the demoralization of trade became acute." (Vernon A. Mund, *Open Markets* [Harper & Bros., 1948], page 163.) (It should

[6] Abraham Berglund, "The United States Steel Corporation and Price Stabilization," *Quart. Jour. Econ.*, November, 1933, George J. Stigler, "A Theory of Delivered Price Systems," *Am. Econ. Rev.*, December, 1949, p. 1152.

[7] *Report of the Commissioner of Corporations on the Steel Industry*, Pt. I, 1911, p. 63. It should be noted that the period under examination in this study antedates the last two years of the century which saw the formation of a number of important consolidations, most of which were, in turn, absorbed by the U.S. Steel Corporation in 1901. (Cf., *ibid.*, p. 79.)

be noted that pools for a number of the industry's most important products were not formed until after the 1890-97 depression had run its course. Thus the structural steel pool and the steel plate pool were not formed until 1897 and 1900, respectively.)

In their final judgments, the authorities seem to be in complete agreement. Speaking of its early years, Myron Watkins describes the industry as "a competitive trade." (Myron W. Watkins, *Industrial Combinations and Public Policy* [Houghton Mifflin, 1927], page 123.) Charles R. Van Hise concludes that "during the period before consolidation, competition had been severe and prices alternately high and low, depending upon the trade conditions and the extent of cooperation." (*Concentration and Control* [Macmillan, 1921], page 113.) The Commissioner of Corporations is explicit: ". . . as a rule the ownership of iron properties was widely scattered and, in this, as in the manufacturing branch of the industry, competition *rather than concentration* was the distinguishing characteristic. . . ." (*Report of the Commissioner of Corporations, op. cit.*, page 66. Italics added.)

The distribution of the copper, lead, and zinc products shown on the lower grid of Chart III is in sharp contrast to the scatter of the iron and steel products. With only one exception—zinc sheets—these nonferrous metals were characterized by greater flexibility in the later than in the earlier depression. It is true that the concentration ratios of manufacturing production for these products are relatively high. It is also true that their prices are extremely flexible. But it does not follow that this association constitutes an exception to Means's argument. The reason lies in the fact that the available domestic concentration ratios for these products substantially overstate the control of the market.

In the first place, these commodities have long been sold on a world market and their prices are immediately responsive to international developments. Hence figures on domestic concentration substantially overstate the control of the market, and the cost position of the US producers accentuates the overstatement. Moreover, they are produced in scattered areas of the world under widely differing conditions, a circumstance which has given rise to numerous conflicts among the different producers.[8] In the second place, concentration figures based on domestic production overstate the actual control of the market because of the important role played by secondary metals: "Copper is

[8] For a discussion of the attempts to establish effective cartels for these products in the later depression, see *International Control in the Nonferrous Metals*, edited by William Yandell Elliott (Macmillan, 1937), Chaps. VIII, X, and XII, by Alex Skelton, and Chaps IX, XI, and XIII by Elizabeth S. May. Similar attempts during the earlier depression are described in the US Industrial Commission, *Report of the Industrial Commission*, Vol. 1, 1900, p. 93, and *Engineering and Mining Journal*, May 18, 1895, and January 5, 1895.

practically indestructible. . . ." In 1930 scrap dealers and secondary refiners supplied 35.9 per cent of the country's copper requirements. In the lead industry, the automobile storage battery reservoir forms "a huge circulating fund"; by 1933 the proportion of secondary to domestic primary lead was 86 per cent, while in zinc the proportion in 1932 was 23 per cent. (Skelton, *op. cit.*, pages 625, 772.) Finally, much of the output of the independent lead and zinc mines can and does find its way to the market through the medium of custom smelters. Inasmuch as these smelters operate on the basis of a fixed margin between the ore price and the refined metal price, it is to their interest "to operate at a high level of capacity, regardless of price." The resulting conflict with the interests of the integrated companies "became apparent from the commencement of efforts to agree on a united policy." (*Ibid.*, pages 727, 711.)

A special factor in the great price decline of copper between 1929 and 1933 was a bit of apparent business stupidity which has few parallels in modern industrial experience: the raising of the price from around 11 cents a pound, where it had remained for several years, first to 18 cents and later for a hectic fortnight to 24 cents. Since industrial output and, with it, the demand for copper were falling rapidly, these prices resulted in a fantastic increase in stocks, and the price subsequently collapsed, dropping to a low of 5.7 cents in 1932. (Cf. May, *op. cit.*, pages 525, 567.)

The final chart, number IV, presents in its upper grid the price changes for four products of the glass industry, two for plate glass (1 and 2) and two for window glass (3 and 4). As between the two depressions, the plate glass items show a great decline in price flexibility and the window glass products a great increase.[9] There is reason to believe that in the former, concentration rose, while in the latter, it fell.

The early growth of the plate glass industry in this country was largely the work of one man—J. B. Ford—who was "an intelligent entrepreneur of the most versatile type." Up to the time when he built his first plant, there were only five plants in the industry, with a combined output of only $355,000. By 1890, there were sixteen plants and the aggregate output had increased more than tenfold, to $5,953,000. Most of this expansion came about as the result of Ford's activities. From the point of view of its effect upon economic concentration, his method of operation was both unusual and significant. After constructing his

[9] Because the consolidation of most of the industry into the Pittsburgh Plate Glass Company took place in 1895, the price comparison for the first depression is between 1890 and 1894 rather than between 1890 and 1897. These first four years of the decade constituted a period of substantial economic decline

first plant, "Ford built one new plate glass works after another, managing each for a short time, *then selling out* to free himself for construction of larger and better plants, representing in every case successively greater capital investment." (Pearce Davis, *The Development of the American Glass Industry* [Harvard University Press, 1949], pages 165, 166. Italics added.) Toward the latter part of the depression of 1890-97, the industry witnessed a great consolidation, out of which emerged the Pittsburgh Plate Glass Company as the nation's dominant producer:[10] "In 1895, through a reorganization, it [Pittsburgh Plate Glass] acquired all but three of the factories making plate glass in the country." (*Ibid.*, page 239.) Since the turn of the century, Pittsburgh Plate Glass has easily dominated the industry. By the twenties the company accounted for approximately 50 per cent of the United States output, "at which point it appears to have been maintained." (Burns, *op. cit.*, page 224.)

In striking contrast to the plate glass industry, price flexibility in window glass was much greater in the later than in the earlier depression. Obviously, the greater severity of the 1929-33 depression would explain only part of the extensive difference in price behavior. For over a decade prior to the earlier depression the window glass industry in the United States "was ruled by the joint power of the combination of workers and the combination of employers." (Davis, *op cit.*, page 131.) Or as another authority put it: "In no branch of the [glass] industry during the period 1880-1920 did organizations of laborers, employers, and wholesale dealers wield as much monopolistic power for as long a time as did those involved in the production of window glass." (Scoville, *op. cit.*, page 217.) Through Local Assembly 300 Knights of Labor of the Window Glass Workers of America, rigid limitations were imposed as to the amount of output to be "blown" per hour, per week, per month; on the number of months worked per year, which were gradually reduced by 1885 to nine; on the amount of the labor supply, etc. "It is thus clear from the beginning of its national history, L. A. 300 assumed rigid control of window-glass production." On their part, employers were organized into the American Window Glass Manufacturers Association, which, it is said, "decided how many and what works should be closed, what wages should be paid (in negotiation with the national union) and what prices charged."[11] In 1895 a

[10] Its predecessor was the New York City Plate Glass Company, organized in 1881. The name was changed to Pittsburgh Plate Glass Company in 1883. But it was not until 1895 that the consolidation was effected. (Warren Scoville, *Revolution in Glassmaking* [Harvard University Press, 1948], p. 239.)

[11] Davis, *op. cit.*, p. 130. For a further description of the detailed methods of restriction used by the union, see Department of Commerce, *The Glass Industry*, Misc. Series No. 60, 1917, pp. 291-293.

selling pool was founded, known as the American Glass Company, which handled the business of 85 per cent of the window glass factories then in existence. The effect of this new organization upon the price level was almost immediate. "The formation in 1895 of the selling pool . . . permitted the price of windowpanes to be pushed upward, not only absolutely, but also relatively to other commodities." (Davis, *op. cit.*, page 176; Scoville, *op. cit.*, pages 230-231.)

In the later depression, concentration in window glass, as compared to other industries, was still relatively high. But as compared to the almost complete control of the industry during the latter part of the 1890-97 depression, exercised through the selling pool and supplemented by the long-standing bilateral organization of workers and employers, the market did not appear to be as tightly controlled. The skilled workers and the use which could be made of their organization to control output had been eliminated by the introduction of mechanized processes. In 1937 it took four companies to account for 85 per cent of the production of window glass. (TNEC Monograph No. 27, *op. cit.*, page 455.) Hence, it would appear that the increase in price flexibility of window glass was accompanied by a lessening of the control of the market.

As will be seen from the lower grid of Chart IV, the showing for anthracite (1 and 2) resembles that of the window glass industry. Prices dropped much more in the later than in the earlier depression; indeed, in the earlier period they rose. From the available information it would appear that the direction of change in concentration parallels that of the window glass industry.

For a considerable period of time prior to 1890, the anthracite industry had been under the close control of a few railroad companies which, through the issuance of large amounts of securities, had been able to purchase most of the anthracite-bearing lands. Concentration of control in this industry is facilitated by the fact that these deposits are highly centralized in a small area, comprising less than five-hundred square miles, in five counties of northeastern Pennsylvania. By 1890 the so-called "line" companies—those owned by the railroads—had obtained possession of more than 95 per cent of the anthracite reserves. (TNEC Monograph No. 21, *op. cit.*, page 179.) The industry had also experienced nearly two decades of attempts to control the market involving at least five separate agreements, or "combinations" as they were termed. (Cf. Eliot Jones, *The Anthracite Coal Combination in the United States* [Harvard University Press, 1914], page 229.) Like most such arrangements, the history of these agreements was typically one of temporary success, followed by recurrent noncompliance and breakdown, and then by reconstitution on a somewhat modified basis.

COMPARISON OF PRICE FLEXIBILITY IN TWO DEPRESSIONS 1890-97 AND 1929-33

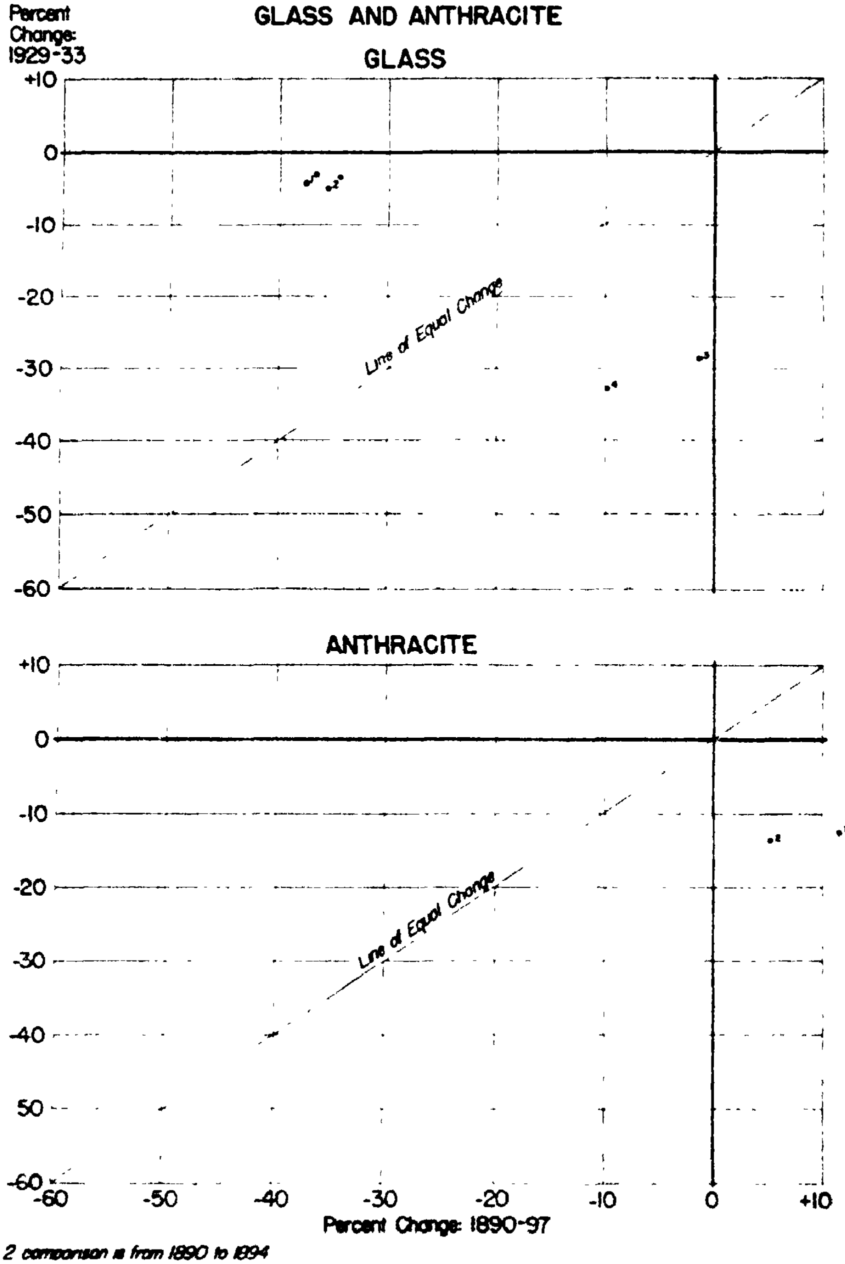


CHART IV

Although other factors were occasionally involved, the root cause of their failure was invariably the same; namely, the refusal of one or more of the leading companies to remain content with its allotted share of the market. (Cf., *ibid.*, pages 43, 45, 48, 50.)

During the depression of 1890-97 there were two organized attempts to control the market, only the latter of which is relevant to the price comparison used in this analysis. This second attempt resembled in form the old allotment plan but differed in substance in that on this occasion the different producers generally did abide by their allotted shares of the market: "The division of tonnage was well adhered to by the companies. *In every case the deviation of shipments from the percentage allotted was less than one-half of one per cent.*" (Jones, *op. cit.*, page 56. Italics added.) The success of the plan is indicated by the increase in price, the average price of stove coal rising from $3.13 a ton in 1895 to $3.79 in 1896 and to $4.01 in 1897. (*Ibid.*, page 56.)

As contrasted with the earlier period, the most important difference in the later depression was the loss in position of the line companies to new large independent firms "who could not be controlled." (William R. Pabst, Jr., "Monopolistic Expectations and Shifting Control in the Anthracite Industry," *Review of Economic Statistics,* February, 1940, page 52.) With the oncoming of the depression, the line companies began to reappraise the value of their tremendous holdings: "The practice of leasing mines to independent operators, large and small, in the years after 1929 indicates the speed with which the line companies hastened to take account of the revisions in expectations." Between 1929 and 1933 the large independents increased their share of the industry's production from 24.8 to 37.7 per cent. For the most part the important independents were new entrants: "The development of these new large independent producers is the most important element of the internal change of the industry." (*Ibid.*, pages 52, 47, 48.) As compared to earlier periods the control held by the line companies had declined substantially. By 1937 the eight line companies accounted for only about 60 to 65 per cent of total production; in 1923 their proportion had been 74 per cent[12] and in earlier years considerably higher. Thus there can be little doubt but that the increase in price flexibility in the anthracite industry was accompanied by a decrease in concentration.[13]

[12] TNEC Monograph No. 21, *op. cit.*, p. 181. These percentage figures are not strictly comparable with those presented by Pabst since, following the Anthracite Coal Industry Commission, he designates ten firms as line companies, whereas TNEC Monograph No. 21 designates only eight as line companies.

[13] Pabst advanced the argument that although (*a*) "the line companies appeared to be acting in coordination," (*b*) "they appeared to be holding their prices up and letting production fall, bringing capacity in line with their potential demand," (*c*) "their adjustment

Two decades ago, one of the liveliest issues engaging the attention of economists was price rigidity—particularly the relationship between such price behavior and the structure of industry. Largely because of the war and the subsequent abnormal sellers' markets, the issue seems to have been all but forgotten. The industry-by-industry analysis presented in this paper shows that in four major areas of the economy—farm products, foods, textiles, and lumber—prices were flexible in both depressions, as would be expected from Means's argument, since these areas were generally atomistic in both periods. Moreover, the analysis also shows *increased rigidity, following the concentration of the industry*, in such diverse fields as iron and steel, salmon, salt, biscuits and crackers, molasses, matches, plate glass, window glass, and anthracite (the last two in an inverse manner).

Now that the abnormal postwar sellers' markets appear to have come to an end, it may be highly appropriate for the economic profession to focus its attention again on the subject of price inflexibility. If one agrees with this observer that price rigidity during a downswing is economically injurious, the reasons for examining the factors which might contribute to such price behavior are self-evident. The results of this analysis, taken in conjunction with Means's own findings, suggest that one of those factors—and an important one at that—is economic concentration. But even if one holds that price rigidity is not harmful, further examination should be made of the manner in which such prices are set, the considerations behind their determination, the economic effects of their being imposed at alternative levels, etc. If this paper has done no more than to contribute to a reopening of interest in this whole question of depression price behavior, it has more than served its purpose.

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was the kind that might be expected from the dominant enterprises in a declining industry beating an ordered, strategic retreat," and (*d*) "the independents . . . were acting on the whole in a way to justify the term 'competitive irrationality,'" nonetheless ". . . the hypothesis that the shifting control in the industry results from differences between the adjustments of competitive and monopolistic producers, in respect to prices and costs, cannot be maintained." The reason that it cannot be maintained, he holds, is that "the individual independent operators did not step up production, but generally, from the largest to the smallest, lost in about the same degree as the line operators." What he is referring to is the behavior of those independents who were in business throughout the period. His observation does not hold true, as he recognizes, of the "new" independents, who accounted for most of the gains shown for the independent group. These firms greatly increased their output and in general followed the norms of competitive behavior.

FULL EMPLOYMENT, WAGE FLEXIBILITY, AND INFLATION[1]

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I

Considerable disagreement has existed during the years since World War II over the extent to which unions have succeeded in exercising an independent effect on wages and prices. Since unions are a form of monopoly, they are in a position to affect the supply of labor.[2] Consequently it is generally agreed that wage rates under unionism are bound to be different from what they would be under a system of unilateral wage changes granted by employers to an atomized labor force. But this measure of agreement does not carry us very far in evaluating the inflationary effect of unions. What we want to know is (1) whether or not union policy contributes to the intensity of the inflationary spiral during a period of partially or entirely deficit-financed military spending, (2) whether it will do so during a peacetime boom in the private sector of the economy, and (3) whether union policy can contribute to a creeping inflation independently of either peacetime or wartime boom spending, and in the absence of a legacy of liquid assets from a previous inflationary period. The present paper is concerned primarily with the third of these alternatives, and thus considers the impact of a rise in cost on the level of spending. Care must be taken to bear these three cases separately in mind when facing up to the question whether or not the existence of unionism injects an "inflationary bias" into the economy.

The effect of unionism on the price level is one aspect of the broader question of the impact of changes in costs on prices and sales. The four

[1] I am indebted to the Graduate School of Northwestern University for aid for research and to the Brookings Institution for its interest in a broader project of which this is a part. Allen Vander Meulen, Jr., was very helpful in the preparation of this paper.

[2] The literature is full of warnings that unless the monopoly power of labor is curtailed or unions use their power with restraint, free enterprise will be jeopardized. Cf., for example, J. M. Clark, *Alternative to Serfdom;* the papers by G. Haberler, E. Chamberlin, and J. M. Clark in D. M. Wright, *The Impact of the Union* (Harcourt, Brace, 1951); and C. E. Lindblom, *Unions and Capitalism* (Yale University Press, 1949); and the criticism by J. Dunlop, *Am. Econ. Rev.*, June, 1950. The evidence for this contention does not seem very strong. Demand inflation is responsible for much of the upsetting effect on democratic institutions that has often been attributed to the power of the unions. Labor may on occasion find itself in a strong position politically, but in a healthy democracy any tendency to make excessive use of a strategic political position ought to produce its own corrective.

links in the chain connecting changes in wage rates with changes in the demand for labor are the relation of wage rates to labor costs, of the latter to total cost, of total cost to price, and of price to sales and output. (Cf. A. M. Ross, *Trade Union Wage Policy* [University of Chicago Press, 1948], page 80.) Clearly there is great variation in the free play in these links from firm to firm and from industry to industry as well as over time.

In assessing the likelihood that unions can force the pace of inflation, the first step is to weigh the effect of a rise in costs on prices. It is accepted that if cost rises are to be reflected in prices, assuming productivity and the volume of transactions unchanged, the rise in cost must cause an increase in the quantity or the velocity of money or both. It has often been pointed out that the world's major inflations have not originated on the cost side. They have resulted either from a bank-financed boom in private investment or from government deficit spending in time of war. Subsequent further inflationary movements, after the initial burst of private or public spending, are likewise to be attributed to the demand side. The public, in drawing upon its liquid assets amassed during the boom, is merely perpetuating a demand inflation. Experience in past inflations, however, is not relevant to the question whether, under conditions of long-continued full employment, the economy would have an inflationary bias in the absence of a legacy of liquid assets from a period of bank-financed inflationary spending.[3] Much of the discussion of inflationary bias in recent years is of limited application, because it tacitly assumes some such period as the decade following World War II. Certainly we are interested in the extent to which the existence of unions and other monopolistic organizations act to accelerate price rises during such a period, particularly if circumstances should dictate years of inflationary government and business spending. But we are also interested in the role of costs—in particular, wage costs—during periods in which demand inflation is not present.

In the present context, an economy is said to have an inflationary bias if, in the absence of a demand inflation, increases in costs set in motion a train of events that lead directly or indirectly to the increases in liquid assets and spending which are necessary to permit the rise in costs to be passed on in higher prices. The bias is much more marked if the initial rise in costs and prices establishes an expectation of a still further rise. A cost rise that is limited to a particular firm or industry is likely at most to encourage a temporary increase in borrowing to meet higher working capital charges. If, however, the rise in cost is

[3] Cf W A. Morton, "Trade Unionism, Full Employment and Inflation," *Am Econ Rev*, March, 1950, and the comment by M. Bronfenbrenner, *ibid*, September, 1950

widely diffused throughout the economy, firms might be prepared to increase borrowing (and banks to permit them to do so), on the assumption that a higher rate of borrowing is appropriate to a higher level of aggregate investment. Consumers likewise may respond to the rise in prices by reducing savings or by expanding installment borrowing. Whether savings are reduced or installment buying increased, the result may be an indirect rise in commercial bank lending, in the former case to businessmen who had previously been borrowing these savings and in the latter to the merchants who are enlarging their credits to customers. These responses, however, do not point in the direction of a spiral of inflation, or even of creeping inflation. Indeed they may be merely temporary, in which case the price level must fall back again to its previous level.

The probably rare appearance of a pure cost inflation in the private sector, however, does not eliminate the possibility that the reaction of the government to cost rises may be calculated to freeze higher costs into higher prices, or even to precipitate an inflationary spiral. If the government feels constrained to counteract any extensive cost-induced unemployment with work-creating fiscal measures, prices may reach equilibrium at a higher price level or may conceivably interact with costs to set up an inflationary spiral. Is there evidence that there has been such an inflationary bias in this country?

If the consequence of a rise in costs were known beforehand to be an immediate and fairly substantial decline in employment, there would seem to be no doubt that an inflationary bias could exist. For no government would dare to refrain from forestalling this unemployment by creating deficits. In practice, however, unemployment usually makes its entrance gradually. Thus a period of doubt is ordinarily experienced, during which debt-conscious administrations are likely to be hesitant to undertake what may prove to have been a premature program of deficit spending or tax reduction. If they wait very long, however, the downswing may become so pronounced that the problem would be one of avoiding deflation rather than inflation.

It seems likely that the view prevalent during and after the depression—namely, that henceforth governments must take remedial steps immediately on the appearance of "Beveridge" unemployment (fewer vacant jobs than unemployed workers)—has been significantly tempered by fears of inflation during recent years. The argument could be made that even if the effect of excessive wage demands were rather considerable unemployment, the probable response in terms of government fiscal policy is hardly likely to have significant purchasing power effects. The unemployment is obviously not "Keynesian," and thus

would not call for action under a Keynesian public works spending program. This type of unemployment is in any case difficult to remedy through aggregative fiscal measures.

Experience in the recessions of 1948-49 and 1953-54 indicates that both Democratic and Republican administrations prefer to react cautiously to moderate downturns. Other issues dominate unless unemployment rises above the figure that is generally accepted as "tolerable." But if this is so, presidents would hardly be likely to recommend immediate action against the relatively small and widely distributed amounts of unemployment that may result from an aggressive wage policy. This view receives support from both the Truman and Eisenhower recession programs. Unemployment stood at 6.0 per cent in June, 1949, as compared with 3.4 per cent in June, 1948; and consumer prices had declined by 3 per cent from the August, 1948, high. The President and Congress, however, were more concerned with the impact of tax relief on the level of the public debt than with the elimination of all vestiges of unemployment. Truman's policy was to bank on an early upturn, while merely laying plans for public works in the event of a more serious decline in business activity. It was stated in the "Midyear Economic Report" of July, 1949 (page 6) that "the kind of government action that would be called for in a serious emergency would not be appropriate now." One reason that the Truman administration was loath to adopt antidepression policies in the spring of 1949 was, of couse, the constant fear of a continuation of the inflationary rounds of wage increases that were experienced in 1948. In the absence of such a fear, the possibility does indeed exist that the appearance of even a small amount of unemployment might produce a quick response in the form of intentionally created federal deficits.

The reaction of the Eisenhower administration to the recession of 1953-54 was very similar. Here again unemployment, according to President Eisenhower's statement of August 12, 1954, had risen from 2.4 per cent in July, 1953, to 5.1 per cent in July, 1954. Prices, however, remained virtually stable during this period. The attitude of the administration toward moderate increases in unemployment has been that "the need for constant vigilance and preparedness by government does not, however, justify constant stirring or meddling. Minor variations in activity are bound to occur in a free economy. . . ." (*Economic Report* of the President, January, 1954, page 113.) Evidently both political parties are torn between a desire to avoid an increase in the national debt and the necessity of keeping public reaction toward unemployment below the political boiling point.

As the argument stands thus far, it is contended that unemployment resulting from a rise in costs is not likely to be so quickly remedied by

deficit-financed public spending or tax reductions that the economy can be said to have a cost-inflationary bias. If, however, unemployment can be eliminated by a rise in government spending without a rise in the debt, an inflationary bias may nevertheless exist. The fear of deficits as a reason for delay in adopting counteracting measures would disappear. An increase in the size of a balanced budget may be inflationary at full employment, provided the prospect is for a continuing high-level aggregate demand. A part of the additional taxes falls on savings, and it can be assumed that the firms which are denied the opportunity to borrow these diverted savings will turn to the commercial banks. Assuming Federal Reserve and commercial bank co-operation, the probable result is a rise in total public plus private spending under inelastic conditions of factor and commodity supply and an upward pressure on prices. The situation is different, however, when unemployment has already appeared or even if a downturn from full employment conditions seems imminent. Taxpayers are indeed still likely to attempt to maintain consumption levels by reducing savings; but it is now probable that at least a part of these savings would have been voluntarily relinquished by businessmen who anticipate a further downturn. Consequently the hoped-for increase in bank-financed private borrowing will not materialize, and no basis exists for the contention that in these circumstances a rise in costs would generate the additional purchasing power necessary to sustain it.

II

A rise in wage cost at full employment in the absence of a demand inflation may or may not establish the conditions for a cost inflation. It could have one of four different effects on the price level.[4] Prices might fall. They might remain at the same level as before. They might rise uniquely with the rise in wage rates. Or an inflationary wage-price spiral might be set in motion. The first of these alternatives might occur if under stable full employment conditions a wage rise suddenly occurred which caused business losses and initiated a contraction of investment, incomes, and prices. In both 1921 and 1930 union wage rates

[4] Much disagreement exists over the consequences of creeping inflation One view is that continuously rising prices and incomes cause distortions that must relatively soon lead to a crisis and depression Opposed to this is the contention that we must resign ourselves to a long-term upward price trend, and that a major problem is to avoid hyperinflation. The view that a persistent inflation is sure to build up gradually a resistance that will halt the upswing stresses such factors as changes in the level of productivity, the rate of new investment, the foreign balance, money market liquidity, the rate of interest, and the elasticity of price expectations. Cf. D. Copland, "The Full Employment Economy, with Special Reference to Wages Policy," *Oxford Econ. Papers*, October, 1953; G Haberler, *op. cit*; and W G Broehl, "Trade Unions and Full Employment," *So. Econ. Jour.*, July, 1953. For the view that in a full employment economy a moderate inflation might be expected for years to come, see S. Slichter, *Business Week*, October 25, 1952.

continued to rise after the downturn. (Cf. W. H. Chartener, *Wages in Deflation,* Editorial Research Reports, June 13, 1949.) The second alternative is a possibility when a consequence of the higher wage rates is either a decline in the rate of return to other factors or a reduction in costs in response to the pressure on firms to increase efficiency. The third, which has been called "static inflation," can occur when, assuming an elastic money supply, price policy is geared to changes in cost. It can also occur as a result of a conscious fiscal policy designed to retard inflation. The fourth—the inflationary spiral—could be initiated by a price rise associated with a wage rise if the increase in worker consumption spending were not offset by a decline in investment and if an interaction were set up between costs and prices. It is proposed to say a few words about the third and fourth of these cases.

The literature is well stocked with models that demonstrate the conditions under which, when wage rates rise, prices must rise by the same amount.[5] Moreover, the frequent publicity accorded in the postwar years to the quick price responses to wage increases has appeared to give empirical content to the findings of these models. Inferences from neither the models nor the empirical evidence, however, have general significance. The former are limited either by the restrictive assumptions of the static cost and demand curves of the individual firm or by those of equally restrictive aggregate economic models. Inductions from the empirical evidence, again, are usually complicated by the presence of demand inflation and are susceptible to the dangers of reasoning *post hoc, ergo propter hoc*. Many instances can be found in which price rises in response to wage increases have later been followed either by price reductions or by the omission of price rises that would otherwise have been made. The wide range of possibilities is illustrated by two examples selected almost at random from recent experience. In France, wholesale prices and wages responded quickly to the 15 per cent rise in minimum wages enacted in September, 1951. Because the rise was general and the underlying situation inflationary, increases in cost could be quickly passed forward and the entire wage-price

[5] Reference may be made *inter alia* to the treatment of wage-price-profit relationships in the *Treatise on Money* and the *General Theory*. See also A. Lerner, AEA *Papers and Proceedings,* May, 1946, p. 331, and the comment by S. Slichter, *The Challenge of Industrial Relations* (Cornell University Press, 1947), p. 79; M. W. Reder, "The Theoretical Problems of a National Wage-Price Policy," *Can. Jour. Econ. Pol. Sci.*, February, 1948, A. Flanders, *A Policy for Wages*, Fabian Tract #281, pp. 31 ff.; A. T. Peacock and W. J L. Ryan, "Wage Claims and the Pace of Inflation," *Econ Jour.*, June, 1953; and, with reference to Harrod's model, A. G. Pool, *Wage Policy in Relation to Industrial Fluctuations* (Macmillan, 1938), pp 116-117. Peacock and Ryan are concerned with the cushioning effects of lags under collective bargaining and under wage escalator arrangements For an examination of the assumptions under which a wage change will cause an equal change in prices, see T. Mayer, "The Effects of a Wage Change Upon Prices, Profits, and Employment," *Econ Jour.*, September, 1951

structure tended to be restored at a higher level. By contrast, because of the highly competitive nature of the American textile industry, New England textile companies in the same year were not able to pass on wage increases escalated by the rise in the consumers' price index. After the introduction of the cost-of-living escalator in 1951, textile prices dropped, some by as much as 20 per cent between the years 1950 and 1952.[6]

The immediate price response to a rise in wage rates will depend on the evaluation by the firm of the market situation, in conjunction with the pricing practices of the industry, as well as on the importance the firm may attribute to the impact on public opinion of a price rise made directly in response to a rise in wage cost. One element in public opinion is the reaction of the union, whose attitude in part reflects its opinion of the effect of higher prices on real wages and employment. Its objections, if any, are likely to have their greatest effectiveness in a delicately balanced political situation, when business may be encountering difficulty in explaining a high rate of profit. Even then firms may be able, in some industries at least, to protect themselves with labor-cost and materials-cost contracts, which permit automatic price increases with a minimum of publicity. However, it is likely to be true that in the absence of a demand inflation the passing forward of cost increases is not likely to become a political issue. The price increases are simply too unimportant.

For several reasons a rise in cost may not be followed by a rise in price. For example, if full employment has continued for some time, markets are likely to have become more favorable to buyers. Unions may, however, have the power to achieve further wage increases. The effect on investment may be negative and prices may fall. Again, if a wage bargain is settled on the expectation of a price rise, the disappointment of this expectation may mean that wage increases have been made that cannot be passed on in higher prices.[7] Gains in productivity make possible wage increases without the need for corresponding price rises.[8] It is probable that the spread of industry-wide

[6] H. C. Eastman, "The Economic Effects of the French Minimum Wage Law," *Am Econ Rev.*, June, 1954, pp 375-376; company testimony, Bates Arbitration case, March 3, 1952

[7] Although cases are rather rare in which explicit account is taken of anticipated price rises in wage agreements (an example is the Austrian 5th price and wage agreement, July. 1951; cf. Bert Zoeteweij, "The Adjustment of Wages to Changes in the Cost of Living," *International Labor Review*, July-December, 1952, p. 101), the expected course of prices is a factor which is always present in wage bargains.

[8] During the defense period, up to the spring of 1941, wage increases appear to have been more than offset by increases in productivity. (BLS Bulletin 1009, Chap. III, "Development of Wage-Price Policies," H. M. Douty.) For an attempt to test the proposition that it is difficult in competitive industries for workers to get productivity increases translated into higher wages, see A. M. Ross and W. Goldner, "Forces Affecting the Inter-industry wage Structure," *Quart. Jour. Econ.*, May, 1950.

bargaining, if characterized by pattern bargaining, would result in many wage increases that could not be followed by compensating price rises. Competition from foreign producers may prevent price markups. The conclusion seems to be warranted that the variety of circumstances in which wage and other cost increases may occur is so wide that wage and price flexibility at full employment has to be studied largely on the basis of individual cases.

In the event that a rise in wages or other costs is reflected in increased products price, the possibility exists that an inflationary spiral may be initiated. An important cushion against the spiral effect, however, is the absorption of part or all of any induced increase in the money supply by the initial rise in prices. This could result in equilibrium at some higher price level. The effect can be produced artificially by taxing the desired amount of purchasing power out of the income stream, provided allowance is made for the possible inflationary effects of the additional taxes.

Equilibrium at a higher price level would not result, however, if two or more escalators interacted rigidly (for example, a cost-of-living escalator and agricultural price parity) at each step in the process inducing the increase in the money supply required to permit an inflationary spiral. The marked increase, in recent years, of escalator devices designed to guarantee shares in the national product multiplies the chances of a cost-push inflation that is separate from the demand-pull of an inflated money and asset supply. It is quite possible that in an economy characterized by the widespread use of escalators, the monetary authorities would find it difficult to resist political pressure to adapt the money supply to the requirements of a constantly rising price level.

Yet it is questionable that the general adoption of escalators would in practice contribute significantly to a spiraling inflation. A striking feature of these devices is the readiness with which, in some foreign countries, at least, steps have been taken to soften their rigidities in the event that they threaten to produce unwanted economic effects. For example, particularly when governments participate with firms and unions in developing an escalator agreement, a number of escape clauses and limitational devices have been concocted to retard its operation in the event of the threat of an inflationary spiral, though of course by no means all have been used in any one escalator agreement. Among these devices are the restriction of escalation to the minimum wage or to the basic wage, escalation of only a percentage of the basic wage, ceilings on escalation, limitation through price controls, devices for delaying escalation, lags between the collection of

price data and the application of the consumers' price index in the escalator formula, and so on.

In addition to those limitations on escalators that are in part intended to minimize the danger of an inflationary spiral, cushioning may also occur by virtue of the heterogeneous purchasing power effects of cost-price rises. The more numerous the escalators, the more ambiguous are the possible purchasing power effects. The probability increases that they are not all in the same direction, but by partially neutralizing each other, tend to damp the upward impulse. Some escalators tend to encourage consumption, but at the same time they may cause an increase in cost that discourages investment. Other escalators may preserve profit rates at the expense of consumption. The multiplicity of escalator arrangements makes it very difficult to draw conclusions. These mechanisms range from wage cost-of-living and productivity escalators, through agricultural parity formulas and the formidable array of business price markup devices, to more novel contrivances like price-index bonds and proposals to escalate social security benefits for changes in the cost of living. In addition, there are a number of special types of rigidities which probably should not be classed as escalators, such as price leadership, horizontal wage (or pattern) escalation, equalizing tariffs, and the like. Thus we cannot say for sure that an escalated cost rise, even when supported by a co-operative monetary policy and magnified by interaction with at least some other types of escalators, will necessarily give rise to a spiral of inflation. Incidentally, it would be interesting to study the circumstances in which escalators tend to breed escalators. The more widespread the practice of escalation, the smaller the reservoir out of which the protected groups can hedge themselves against inflation and the greater the pressure on all groups to participate in the protection. Under certain assumptions, the result could be an accelerated rate of adoption. Again, rising real incomes and the increasing importance of the small saver provide fertile ground for fostering the popularity of parities and escalators.[9]

III

We come now, very modestly, to the question posed at the beginning of this paper: Has there been a tendency either to exaggerate

[9] For the Swedish plan for hedging pensioners against inflation as well as assuring them participation in productivity increments, see Alan Peacock, "Social Security and Inflation," *Rev. Econ. Stud*, 1952-53, pp. 169-173. The Christiansen Corporation has recently offered employees an issue of cost-of-living debentures, with a ceiling of 150 and a floor at the issue price of 100. (*Management Record,* June, 1953, p. 200.) These are merely random examples of the wide variety of experiments that have been made in many countries, a number of them going back to the early twenties.

or minimize the effects of unionism on wages and prices in the propagation of a cost inflation? If the effects have been exaggerated, have they nonetheless been significant? One is struck by the difficulty of answering this question unambiguously. It is common to make specific comparisons that may have little or no general application. In individual instances it can sometimes be asserted that the direct effect of the union was either to accelerate or retard wage increases. It is more difficult to understand what this proves about the over-all impact of unionism. In arguments intended to minimize the importance of union power to influence wage decisions, the procedure has often been to consider a situation in which, if the union had been suddenly dissolved, wages would have risen more rapidly. This ignores the role of the unions in events up to that moment, and attributes no importance at all to the threat of unionism as a factor affecting wages in nonunionized industry.

An illustration of this type of thinking is the suggestion that collective bargaining may be a less effective way of achieving wage increases than is reliance on the free play of market forces.[10] It is true that unilateral wage increases can be made rapidly, while the reopening of contracts and the process of collective bargaining are more time consuming. But this is no valid basis for evaluating the general effects of unions on wages. Would the same unilateral increases have been made if unions did not exist? Again, wage increases are sometimes made in order to prevent unions from getting a foothold in the industry. Although such raises appear in the statistics on the nonunion side, they are actually attributable to the existence of unions. Another point is that firms are said to dislike to grant wage increases in organized industries because unions will resist wage reductions even if the price level subsequently falls. But, as Slichter points out, even in unorganized industries account must be taken of the effect of a wage decrease on worker morale. More generally, there is no reason to minimize the influence of unions merely because they crystallize employer opposi-

[10] Cf., for example, M. Friedman, in Wright (ed.), *The Impact of the Union*, pp. 204 ff.; A. Rees, "Postwar Wage Determination in the Basic Steel Industry," *Am. Econ. Rev.*, June, 1941; W. A. Morton, "Trade Unionism, Full Employment and Inflation," *ibid.*, March, 1950; Clark Kerr, "Labor Markets: Their Character and Consequences," AEA *Papers and Proceedings*, May, 1950, p. 228; K. Boulding, "Collective Bargaining and Fiscal Policy," AEA *Papers and Proceedings*, May, 1950, pp. 306 ff. The opposite position is taken by Haberler, *op. cit.*, pp. 34 ff.; S. Slichter, "Do the Wage-fixing Arrangements in the American Labor Market Have An Inflationary Bias?" AEA *Papers and Proceedings*, May, 1954, p. 331. For an examination of some of the statistical work done on the effects of collective bargaining (not of the institution of unionism as a whole) on wage rates, see M. Bronfenbrenner, "The Incidence of Collective Bargaining," AEA *Papers and Proceedings*, May, 1954, pp. 297-299. He concludes that the evidence, though partial and contradictory, is in favor of "some slight tendency" for union wages to lead nonunion wages, but that collective bargaining has not had any important effect on aggregate income distribution.

tion to wage increases. Still another argument is that by taking account of local conditions in bargaining, unions are often really accepting the nonunion wage level. But unions could hardly do otherwise than take account of local conditions, along with other considerations.

The fact that union leaders may pursue a go-easy policy has been used to discount the impact of the unions on wage rates. Variations in union aggressiveness have indeed often resulted in important effects on wage rates, and it is possible that union policy could be so moderate that its relative effect is deflationary. (An example that might be cited is the "New Wage Policy" adopted by the AFL when Green succeeded Gompers as president. The tying of high wages to high productivity was associated with a decline in union militancy.) If inflation proceeds at a rate in excess of what is regarded as politically tolerable, union leaders may have to be satisfied with trivial face-saving gains that do no more than preserve their power with the rank and file. In this reaction they are simply yielding, as they must, to the complex of economic and political forces which determine the degree of public support for their policies.

It has often been pointed out that a union characteristic that can contribute to the alleged inflationary bias in the American economy is the fact that labor policies are the product of the internal politics of the unions, and that immediate monetary gains are uppermost in the minds of the leaders, virtually to the exclusion of the welfare of the country as a whole.[11] The argument often goes on to state that union leaders have to bargain for the concessions that will call forth the greatest measure of support from the rank and file. This means, for example, that the employment effects of wage bargaining may be assigned little importance when the leaders are concerned only to command the approval of employed union members or when, in a declining industry, the union is trying to reduce membership. The reverse, however, could just as easily be so and will be so when the leaders have reason to believe that employment considerations are uppermost in the minds of the rank and file. The extremes are illustrated in two recent cases. In their race with the steel workers to upset the government's wage stabilization program during the period 1950-52, the United Miners matched aggressiveness with the United Steel Workers, ignoring the unemployment and short time already existing in the coal industry. On the other hand, the Massachusetts shoe industry

[11] This issue is discussed by, among others, S. Slichter, "The Government of Trade Unions," Chap. 4 in *The Challenge of Industrial Relations;* Broehl, *op. cit.;* J. Dunlop, "The Economic Model of a Trade Union," *Wage Determination under Trade Unions* (Macmillan, 1944), Chap. III; and Arthur M. Ross, *Trade Union Wage Policy* (University of California Press, 1948)

provides an instance in which a union has agreed, under the so-called "grade system," to wage reductions in the interest of reduced unemployment.[12] A more recent example occurred in the summer of 1954 at the Studebaker plant. In intermediate instances, unions have often justified an aggressive bargaining policy on the ground that the employment effects of higher wage rates could be neither predicted nor estimated.

A familiar criticism of the American labor movement is that it lags behind European unions in the appreciation of the effects of its actions on prices and on economic welfare as a whole. There is ground for believing that part of the reason for American labor's self-centered view toward economic matters is the difficulty of arguing convincingly that an aggressive union policy is more inflationary than a supine one. This difficulty is not likely to be removed until more detailed models of the determinants of income and prices have been developed than are now at hand. Another factor that is partly responsible for aggressive union activity in this country is the high productive capacity and relatively favorable international economic position of the United States, which provide a certain amount of slack in the bond between wages and prices. Despite the high level of personal income, the consumer price index has been virtually stable since the end of 1951, and a number of markets have become buyers' markets, as the growth of the merchandise discount houses testifies. The situation has been quite different abroad. In some foreign countries, where the balance-of-payments or investment programs seemed to require it, unions have been very effective in holding down wage rates despite the protests of the rank and file. In assessing these cases, it has to be borne in mind that if the unions had not shown a policy of restraint, direct controls would probably have been imposed. Therefore we cannot say surely that even in these instances the net effect of the unions on wages and prices has been negative.

An illustration of fluctuating union aggressiveness is offered by the experience of Britain. Rising living costs after World War II had led to a more aggressive union policy and in 1947 to the breakdown of the wage-stabilization policy inaugurated in 1940. Yet the unions responded favorably to the government's plea for wage stability in order to avoid worsening the balance of trade. The failure to halt the rise in the cost of living, however, resulted in another shift in union policy a few months later. On balance, over the entire period, the policies adopted by the unions played a part in restraining inflation. (Cf. J. T. McKelvey, "Trade Union Policy in Post-war Britain,"

[12] S. Slichter, "Do the Wage-fixing Arrangements in the American Labor Market Have an Inflationary Bias?" AEA *Papers and Proceedings*, May, 1954, p. 342; J. P. Shultz and C. A. Myers, "Union Wage Decisions and Employment," *Am. Econ. Rev.*, June, 1950, pp. 364 ff.

Industrial and Labor Relations Review, October, 1952.) In Germany, too, the unions have for many years supported a policy of low wages in the interest of both the export market and a high rate of capital formation. Although (as the strikes of August, 1954, have indicated) the attitude of the unions necessarily stiffens after many years of abnormally low wages, the high proportion of Germany's national income that has been saved and invested in recent years is in considerable part testimony to the modest demands of the trade-unions.

Many statistical comparisons between union and nonunion wage rates have been made in an effort to draw general conclusions on the impact of the unions on wages and prices. Unfortunately they may suffer from the fact that union and nonunion wages are interdependent. Partial studies, restricted to a particular industry or period of time, cannot tell us how high wage rates would have been if labor had never been organized or what they would be if labor policy were integrated under a unified labor movement.

There is, to recapitulate, one set of circumstances in which creeping inflation, which might develop into an inflationary spiral, would be definitely attributable to the power of the unions. At full employment, even in the absence of a demand inflation, unions would be strong; and widespread, aggressive wage demands could be responsible for adversely affecting cost-price relationships to the point at which unemployment developed. If the unemployment were very substantial and if the government responded with deficit-financed re-employment measures, full employment might be preserved at the cost of a constantly rising wage-price level. But experience under neither Democratic nor Republican administrations provides a basis for a fear that this is likely to occur. The opinion is ventured here that even if a labor-oriented administration were to adopt this policy, long before the inflationary stage was reached the opposition of nonlabor political elements would have forced its surrender.

IV

Whatever doubts may be raised over the likelihood of a pure wage-cost inflation, past experience with demand-cost spirals indicates that under certain circumstances aggressive union policy can be expected to play a part in the chain of events that contribute to inflation under full employment conditions. A number of proposals have been made to eliminate this inflationary effect of unions. In general, however, they are unsatisfactory, for either they do not hold forth much promise of success in the foreseeable future or they threaten to produce undesirable economic or political effects. One suggestion is to protect labor through cost-of-living subsidies, avoiding inflation by using progressive taxation to prevent effective demand from outrunning supply.

Apart from the narrow limits to the further use of redistributive taxation and the possibility that investment and output in the future would be adversely affected, this plan does not provide unions and union leaders a reason for existing. Many economists believe that in a free enterprise economy, unions are an indispensable element in the multilateral monopoly struggle for shares in the national product.

Another suggestion is to control prices, leaving it to the employers to deny the wage increases that would eat into profits. (Cf. Gösta Rehn, in Ralph Turvey, editor, *Wages Policy Under Full Employment* [Hodge, 1952], page 49.) Why should the business community give political support to such a suggestion, unless employer resistance were backed by a far severer Taft-Hartley than advocates of the proposal would probably be prepared to countenance? A milder version is for the public in some sense to "reserve its approval" for the employers who oppose excessive wage claims. This proposal has no operational usefulness. It would be better to permit the public to act in the only way it can; namely, by turning away from labor at the polls. Some proposals make their appeal to the union itself: learn to use monopoly power with restraint and thus avoid government control; do not make the union leader too dependent on the favor of the rank and file and thus grant him a measure of freedom for statesmanship; or deposit part of the responsibility for wage policy in the hands of the government. In cases of national emergency, to be sure, an appeal can be made to the union on the basis of public interest; for example, acceptance of a policy of wage and price restraint in order to avoid devaluation or of a low wage policy to encourage a rapid rate of business saving and investment. The general criticism of these suggestions is that except during an emergency they are difficult to implement. Where should the line be drawn? If union leaders are too independent of the membership, the spirit goes out of the unions; and if too dependent, a highly aggressive wage policy may be unavoidable. And what record is there of a power group imposing restraints on itself?

More novel, and probably not very seriously meant, proposals are such devices as: a series of sudden price deflations, engineered in order periodically to get down the whole wage-price structure without the discouragement to investment and consumption that is associated with a slow deflation; the stabilization of the prices of basic commodities by the commodity money plan; and the wage-money plan. (See Boulding, *op. cit.*, pages 318-319.) Still another expedient would be to immobilize a part of increases in wages through some form of profit sharing, thus increasing the proportion of national income devoted to saving and investment. A. Vermeulen ("Collective Profit Sharing," *International Labor Review*, June, 1953) offers a plan for restraining

labor costs in the interest of long-term investment acceleration, while avoiding the increasing inequality of wealth which he believes is ordinarily associated with unaggressive union policy.

V

Because of the rather limited prospects for the acceptance and fruitfulness of any of the above proposals as a permanent defense against cost inflation, it might be worth while for economists to take a second look at the circumstances in which a prolonged creeping inflation, not attributable to demand, is possible or probable. Observers are divided on this point; but there is little in our past experience that leads one to suppose that in the absence of wars, prices would be likely to rise indefinitely. If, however, prices are not likely to do so, the case is weakened for taking seriously any of the doubtfully viable proposals that have been made to soften the wage demands of unions.

Again, there is need for a greater measure of agreement on what is meant by the "limits of tolerable inflation." The concept has no precise meaning, either economically or politically. Within these limits, such inflation as might occur would, by definition, not be worth combating. At the same time the undesirability of an excessive amount of creeping inflation is beyond dispute. The evaluation of alternative meanings of the concept is outside the scope of this paper, but it is suggested that no meaningful definition is possible without allowing for the institutional changes that can be expected to occur as a result of a gradual inflation. The limits of tolerable inflation tend to be extended by the manufacture of devices for hedging various groups against a secular price rise. Thus the argument that bondholders, for example, would resist a gradual expropriation by a fall in the purchasing power of money has to be evaluated in the light of the possibility of escalating debt obligations with a cost-of-living index. Similar defenses might be erected to protect insurance policy holders, social security beneficiaries, and persons with relatively rigid earned incomes. However unlikely the general adoption of these devices in this country may appear on the basis of past experience, the picture might alter considerably if we were confronted with continuous inflation. Quite a different view is that the tremendous growth in fixed claims in recent years, when projected into the future, may strengthen inflationary sentiment among the active earning segments of the population, as well as on the part of those politicians who are concerned to bring about a rise in the proportion of national income taken by government factor purchase expenditures. In a society in which some groups favor inflation and others oppose it, the outstanding characteristic of the limits of tolerable inflation would appear to be their variability.

DISCUSSION

GIDEON ROSENBLUTH: Mr. Blair's revival of an old controversy is most timely. With the decline of agricultural prices in recent years and the appearance of "rolling readjustment" in business conditions generally, there is renewed public interest in the apparent rigidity of certain prices. The paper is also timely in terms of the history of economic thought. Gardiner Means argued in the thirties that concentration of market control had increased, that price rigidity had increased, and that the latter trend was due to the former. Critics soon produced evidence to show that price rigidity had not increased since the nineties or even earlier times, and more recent studies have suggested that concentration has not increased in the last fifty years. Surely the time was ripe for someone to point out that the denial of the first two parts of Means's thesis could be construed as support for the third. If neither concentration nor price rigidity had increased, the two might well be related.

Blair's method is novel and ingenious, and he has given us a number of most interesting case studies. Information, both qualitative and quantitative, from a great variety of sources, has been skillfully combined and brought to bear on the difficult question of the trend in concentration. Of particular interest is the discussion of the degree of market control in the period preceding the great merger movement—an area still largely unexplored.

Can we regard Blair's findings as establishing that concentration is a significant factor making for price rigidity in the American economy? To answer this question I should like to discuss briefly the interpretation of the findings and the nature of the sample.

The essence of Blair's new approach is described in his paper as follows: ". . . contrasting a product's price behavior in two depressions—before and after the industry had become highly concentrated."

This method is applied directly to only two industries: steel and plate glass. Other industries are discussed, either in order to provide a backdrop (farm products, food, textiles, and lumber) or to provide a contrast (copper, lead, zinc, window glass, anthracite). It is doubtful whether results based on a sample of two industries can safely be generalized. Moreover, the interpretation of the results for steel and plate glass is not beyond question. The steel industry is well known for discrepancies between quoted prices and actual terms of sale, and Nelson found evidence of a similar discrepancy (though probably less important) for plate glass (Appendix 1 of the National Resources Committee study, *The Structure of the American Economy,* 1939, pages 182, 183). Blair presents evidence to show that secret discounts were not unknown in the earlier depression. But if discounts are important and variable, the quoted prices used by the Bureau of Labor Statistics are not a reliable guide, and the fact that we do not know whether discounts were more important in the second depression than in the first surely cannot increase our confidence in the reliability of the price data.

The price behavior of plate glass suggests an additional difficulty. It is common practice to measure price flexibility, as Blair does, by the price decline between two reference dates common to all the price series studied, and not by the decline in each price between its own specific peak and trough. This must mean that a spurious impression of rigidity is created for those series that do not closely coincide with the general business cycle in their fluctuations. Surely a price should not be called rigid merely because the market forces that cause it to fluctuate do not exactly coincide in their timing with those influencing other prices. Plate glass would appear to be a case in point, since the two price indexes which declined by only 4.3 per cent and 4.8 per cent, respectively, between 1929 and 1933, fell by as much as 30 per cent and 32.4 per cent between 1929 and 1935.

It may be argued that this is too pessimistic a view of the general significance of the findings. The number of industries in which increasing concentration is found to be associated with increasing rigidity is, after all, in fact greater than two. In addition to steel and plate glass, there are canned salmon, salt, soda crackers, molasses, and matches—all of which are discussed in some detail. But these five industries were selected by a process that involves some bias. They were singled out for special study because they displayed increasing rigidity, in contrast to the majority of industries in the foods and lumber groups. If all the industries in these groups (and in the textiles and farm products groups) had been examined with equal care, one might have found a considerable number with increasing concentration and constant or decreasing rigidity. There are seventy-five products in the study with constant or decreasing price rigidity for which concentration change was not specifically examined. One cannot simply assume that none of them would show increasing market control on closer study.

It may be further argued that acceptance of the hypothesis that concentration and price rigidity are related should not be made to depend on cases of increasing concentration alone. Are there not cases in which decreasing market control is associated with decreasing price rigidity?

Evidence is presented suggesting decreasing market control in two industries: window glass and anthracite. These two industries also display a greater price decline in the second depression than in the first. But, as pointed out by Blair, we cannot regard this as evidence of decreasing rigidity, owing to the greater severity of the second depression. We have, in fact, no way of distinguishing between cases of constant price rigidity and cases of decreasing price rigidity.

The great majority of the industries included in the study have constant or decreasing price rigidity and the author suggests that there has been no significant change in concentration. (This applies to the farm products, foods, textiles, and lumber groups, as well as to the copper, lead, and zinc products.) These findings are of course consistent with the hypothesis that market control leads to price rigidity. But they are equally consistent with the hypothesis that market control has nothing to do with price rigidity, and that neither of them changes much over time.

I have said enough to suggest that the findings of this paper cannot be

generalized unless a larger number of industries can be found in which decreasing or increasing concentration and price rigidity can be clearly identified and the association between them studied. There is room for further research.

If further investigation confirms the existence of a correlation between increasing concentration and increasing price rigidity, other possible influences on the amplitude of price fluctuations would have to be considered in order to determine whether there is in fact a net influence of concentration on rigidity when other factors are held constant. For example, the studies that have demonstrated a close relation between price rigidity and rigidity of direct costs cannot be ignored (e.g., A. C. Neal's study, *Industrial Concentration and Price Inflexibility,* 1941). Hence the movement of direct costs in 1890-97 and 1929-32 ought to be compared in the industries under study. I shall consider some other factors later in this discussion.

There would perhaps be less resistance on the part of many economists to the acceptance of the idea that concentration leads to price rigidity if they were given a good theory to explain why this should be so. It is true, of course, that price rigidity would not exist under conditions approximating perfect competition. At least this is true if rigidity of price is measured in relation to average costs. Hence some degree of market control is necessary for price rigidity. But what has not been shown is why those possessing market control should find price rigidity desirable.

There have of course been attempts at such a demonstration. One old favorite, the kinky oligopoly demand curve, has, I think, been adequately dealt with by Stigler in his article in the *Journal of Political Economy* in 1947. Another is the idea that monopolists dislike the unfavorable publicity that would result from a rise in their selling prices, and do not lower prices in depression for fear of having to raise them again. This hardly seems plausible when one considers the great volume of unfavorable publicity accorded the alleged price rigidity of products made by large corporations in the thirties.

I find it more reasonable to believe that some of the conditions that make price rigidity desirable (i.e., profitable) have nothing to do with market control (though of course firms can only adjust to them if they have some market control) while others, which are related to market control, apply only to a limited number of cases. Hence one would expect the correlation between concentration and rigidity of price in relation to cost to be significant but very weak. This is in fact what A. C. Neal's careful study shows and is consistent with Means's findings and those of the present paper.

Among the first group of conditions, I think the desire to minimize cyclical fluctuations of demand is important. This would help to explain not only actual cases of price rigidity but also the many cases in which rigidity of the quoted price is combined with flexibility in the actual terms of sale (by varying discounts and allowances, credit terms, freight absorption, etc.). The effect of price changes on expectations has often been discussed. If a price reduction, made in response to falling demand, leads to the expectation by buyers of further price adjustments, demand will fall even more rapidly.

Where fluctuating demand imposes heavy costs on the firm (because of heavy overhead and difficulty or cost of producing for inventory), both upward and downward price rigidity may therefore be desirable. Even more desirable may be the policy of keeping quoted prices rigid while varying the actual terms of sale. The rigid quoted price serves to influence buyers' notions of what is normal and to discourage the expectations of further concessions, while changes in the terms of sale accomplish the static adjustment to changing demand.

Empirical studies of price rigidity suggest that this concern with buyers' expectations may be an important factor. Very strong contrasts are found between the rigid prices of durable goods and the flexible prices of nondurable goods. Similarly the rigid prices of capital goods contrast with the flexible prices of consumer goods and producers' materials. (See, for example, F. C. Mills, *Price-Quantity Interactions in Business Cycles* [New York, 1946], pages 46, 47, 54.) Purchases of durable goods, such as capital goods, can be postponed, so that the buyers' price expectations are important, and the cyclical variability on the demand for these products is well known.

Neal has suggested that the sellers' expectations as to future market conditions may promote price rigidity by raising user cost in depression. Since user cost is a more important factor in capital intensive industries, it may be worth while to investigate whether capital intensity is correlated with price rigidity. Perhaps part of the weak correlation between concentration and price rigidity simply reflects the fact that both are related to capital intensity.

Among the second group of conditions, the cases where market control involves collusion have been frequently pointed out. Every revision of a price agreement opens the door to controversy and thus imperils the continuance of the agreement. Hence frequent revisions are avoided. Collusion is, however, probably not typical of situations of market control in the American economy today.

Mr. Blair deserves our thanks for reopening this important controversy, which has never been satisfactorily settled, and for suggesting promising new lines of research.

FRANK C. PIERSON: The paper presented by Mr. Poole, to which I will confine my attention, steers a middle course in an area where extreme positions were once the order of the day. He makes a three-way distinction between inflation in periods of deficit-financed military spending, in peacetime booms in the private sector, and in periods of creeping inflation independent of either peacetime or wartime boom spending, which I find both helpful and dangerous —helpful in avoiding the tendency to generalize too broadly from the special circumstances surrounding such severe inflations as 1946-48, but dangerous in suggesting that long-run inflation can be anything other than the net result of a series of short-run situations. Thus, any long-term inflationary bias which union wage policy may impart to the economy cannot be disassociated from the role which unions play in different phases of particular, presumably successive, cyclical periods.

The fact that, currently, the subject of union wage policy as a cause of

inflation may strike some as rather quaint, if not downright quixotic, is symptomatic of the rapidly changing world in which we live. Even the more optimistic projections foretell a further rise in unemployment in 1955 over 1954, despite an expected increase in real national product. Similarly, discussions of longer range prospects are giving increasing attention to the problem of structural unemployment, suggesting that long-term growth influences in the private sector may well not be strong enough to keep the economy close to its full employment potential. In this kind of environment, the question of union wage policy as a cause of inflation becomes something less than the burning issue of the hour.

Reference to the current position and longer term prospects of the economy underscores the importance of distinguishing between different types of full employment or high-employment situations in analyzing possible inflationary effects of union wage policies. If it is assumed that the economy, in a single leap as it were, suddenly achieves full employment, that labor and physical resources are literally fully utilized or even overstretched, and that supply inelasticities are much in evidence, analysis of the role played by unions leads to one set of answers. If, on the other hand, the economy is assumed to be moving rather gradually towards full employment and that severe labor and other resource scarcities are not developing, a quite different set of answers is obtained.

Economists—quite rightly, in my judgment—have given increasing attention to the possibility of inflation developing under conditions of less than full employment. The general rationale of this view is that wages and prices may rise rather quickly in conjunction with relatively small increases in aggregate demand and employment. (The 1933-37 period is sometimes cited as a case in point.) The converse of this proposition also deserves attention; namely, that despite the continuation of generally prosperous conditions, small increases in unemployment are quite likely to occur and when they do, they quickly lead to a slackening off, if not complete cessation, of inflationary influences. Speaking particularly of union wage policy, this is one of the main lessons to be derived from the last two recessions, 1948-49 and 1953-54. In both periods, wage increase pressures attributable to unions declined markedly and the increase in the general level of money wage rates, even allowing for gains in fringe benefits, was hardly more than the oft-cited 2 or 3 per cent average annual increase in physical output per man-hour.

The other side of the coin is the long-run effect on wages and prices which can be attributed to union policy during successive contraction periods. Since it seems clear that under collective bargaining wage rates are less likely to fall in periods of declining demand than under conditions of nonunionism and, therefore, that any rise in wage rates will start from a higher base than would otherwise obtain, the effect of union wage policy over the long run is to make prices generally higher than they would be in a world without trade-unions. Indeed, it is in periods of falling demand or of continuing general unemployment that union policy doubtless has its greatest effect on wage rates and prices. As already noted, in the 1948-49 and 1953-54 contractions, the level of money wage rates was not only maintained but was even increased some-

what. Isolated cuts occurred, but only as last-resort measures to cope with extreme situations. Lacking collective bargaining, there can be no doubt but what wage reductions, and hence price reductions, would have been more widespread in these two periods. If account were taken of all the other price-sustaining influences operating in periods of declining business activity, the possibility of any significant drop in the general level of wages and prices seems remote indeed.

For a variety of reasons which need not to be enumerated here, most economists would not recommend widespread wage cutting as a way of dealing with cyclical declines. I share this view and presumably Mr. Poole does too. But are we prepared to deal with the consequences of the alternative policy; namely, that wages and prices will follow an upward trend over time, rising in expansions considerably more than they fall in contractions? Mr. Poole notes that in both the 1948-49 and 1953-54 recessions the government was slow to resort to deficit financing as a way of dealing with the decline in business, suggesting that any inflationary pressures stemming from this quarter need not be taken too seriously. As a bit of contrary evidence, he might well have mentioned the fact that in the 1954 Congressional elections the Democrats were on the whole singularly successful in exploiting the small increase in unemployment which had occurred in the immediately preceding period. From the viewpoint of long-run relationships, however, the point deserving greatest emphasis is that the general level of wages and prices showed little tendency to decline in either of these two contractions. With wage and price cuts removed as a way of coping with business recessions, the long-term trend in the money-price level can hardly be anything else but up.

This makes Mr. Poole's analysis of union wage pressures in periods of expansion or high employment doubly important. If unions not only prevent money wage rates from falling in contractions but also push them up markedly in expansions, the long-term prospect for the value of the dollar would seem to be decidedly dark. Again, Mr. Poole is inclined to take an optimistic view, arguing there is no convincing evidence that unions exert an independent influence on wage rates in expansions and that a rise in wage rates need not necessarily mean a corresponding rise in the total quantity and/or velocity of money. Those who take issue with these two propositions have to go pretty far afield, citing political or other indirect influences exerted by unions of an equally vague or tenuous nature to buttress their argument. Compared to such factors as heavy replacement needs, large accumulations of liquid assets, bursts of investment spending, consumer buying on credit, and the like, union wage policy can hardly be more than a minor element in peacetime inflations. This being so, proposals designed to hamstring unions on the grounds they are a major influence making for inflation in expansions would seem to fall far short of the mark.

The foregoing suggests that the only significant long-run inflationary influence that can be properly attributed to unions results from their efforts to hold up wage rates in periods of decline or depression. The inflationary effects of union wage policies in periods of expansion appear to be relatively minor and it is in these periods, of course, that inflationary pressures are most active and

of greatest consequence. This is not to argue that unions can or should escape the effects of measures taken to ward off or control inflationary developments in periods of cyclical or longer term expansion. On the contrary, if a vigorous counterinflation program is undertaken by the monetary and fiscal authorities, the unions are likely to be among the first groups to feel its repercussions in terms of increasing job insecurity, employer resistances, and antistrike sentiment among the membership. Nor would many argue that the unions should be immune from the consequences of policies required to preserve general economic stability, especially since the unions' continued existence as free institutions clearly depends on the successful execution of such policies. What is important is to keep inflation control measures on as broad and impersonal a basis as possible, with all groups carrying their share of the burden and no one group benefiting from the weaknesses or difficulties of any other. A program to check inflation by singling out a particular group for punitive action is hard enough to defend in terms of social equities, but it is even more questionable in terms of effective economic policy.

PRICING IN TRANSPORTATION AND PUBLIC UTILITIES

SOME IMPLICATIONS OF MARGINAL COST PRICING FOR PUBLIC UTILITIES

By WILLIAM VICKREY
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As a preface to a discussion of the role of marginal cost pricing, it is perhaps well to state explicitly that in common with any other theoretical principle, the principle of marginal cost pricing is not in practice to be followed absolutely and at all events, but is a principle that is to be followed insofar as this is compatible with other desirable objectives, and from which deviations of greater or lesser magnitude are to be desired when conflicting objectives are considered. On the other hand, I propose to maintain that marginal cost must play a major and even a dominant role in the elaboration of any scheme of rates or prices that seriously pretends to have as a major motive the efficient utilization of available resources and facilities.

Some of the conflicting considerations may be mentioned briefly. On a mere mechanical level, there is always the cost involved in the determination, publication, and administration of a rate structure. The relative importance of this consideration obviously declines as the value of the unit of sale becomes larger, so that, for example, one could expect that more refinement would be justifiable in the case of overseas airline fares than for short-haul train trips. Ability of the consumer to respond intelligently is also a limiting factor of a somewhat similar force. Thus a service used frequently by the same individual, such as local transit, will bear relatively more complexity than a service used rarely, such as parcel checking. And services used primarily by business firms, whose choices among alternatives are in the hands of relatively expert specialists, will also bear more complexity. Thus freight tariffs can stand being fairly complex, though this is by no means a justification of the present jumble.

Another consideration that may in some cases operate to require modification of pricing policies based on marginal cost is the desirability, other things being equal, of minimizing inequalities in income. In an ideal world where there existed an ideal income tax capable of producing any desired distribution of income without administrative expense or deleterious effects on incentives, it would be possible to leave

to this measure all redistributions of income, and determine rates on the basis of securing the best possible allocation of resources. In practice, however, such measures of redistribution always have, at the margin, some deleterious effects, so that if modifications of the pricing scheme can be shown to have significant effects on the distribution of income, it will in general be desirable to depart at least to some extent from the strict marginal cost price system. For provided that the departure is small enough, it will in general be possible to provide for some improvement in the distribution of income with a cost in terms of impairment of incentives and misallocation of resources that is less than if the same improvement had been achieved through additional direct redistributive measures, such as increased income taxation. In many cases, however, the relation of the pricing structure of a particular utility service to the distribution of income will be slight or uncertain; in which case the distributional considerations will be correspondingly irrelevant. It is indeed likely that in most cases the magnitude of the modification that would be appropriate on this basis would be small. A major exception may be in the pricing of local transit services, where the incidence of a fare increase, regarded as a tax, is far more regressive than any substantial revenue for which it might be considered a substitute. This consideration would argue for pushing transit fares below the level that would otherwise be appropriate and even, possibly, below marginal cost.

Another point at which prices based on marginal cost may require modification in practice is where such prices come into too violent conflict with popular notions of equity. For example, it is clear that on marginal cost principles, transit fares should be substantially higher during rush hours than during off-peak hours. Yet a proposal of this sort is likely to be considered inequitable by many if not most of the lay population on such grounds as that rush hour riding is less comfortable, is more of a necessity, is more heavily concentrated among low-income groups or at least among working people; or is, according to some naïve method of cost allocation (as by first computing a cost per vehicle-mile and then dividing this by the average load at various times), less costly. Some of these notions of equity may be considered to be valid in their own right, as the above consideration for the relative income level of the rush hour riders would be if the facts as to the income distribution of riders actually bore out the assumption. Other notions of equity may be so strongly held as to require, as a matter of practical politics, some consideration in the design of rate structures if the proposals are to succeed. But while the economist may have a role to play in the design of such compromise measures, these compromises should in most cases be regarded as inferior solutions to be

superseded by better ones as soon as public opinion can be educated to a more rational view.

Other considerations of a general nature, such as the desirability of promoting decentralization, health, intersectional and international enlightenment, and so on, may have a bearing on the selection of rate structures. But the modifications that might be justifiable on such grounds are in many cases minor and of an uncertain general direction, and as very little of the opposition to marginal cost pricing stems from such considerations, I will leave them with this brief acknowledgment.

By far the most important of the considerations that conflict with the strict application of marginal cost pricing is the need for revenues. Many of the more extreme advocates of marginal cost pricing for decreasing-cost industries seem tacitly to assume that the government has some perfectly costless and neutral source of revenue that is capable of very substantial expansion without ill effects. Such a state might be approached, for example, if we had an income tax free of its multiple defects, evasion proof, with no marginal costs of administration or compliance, and including in its base not only money income but all forms of direct income in kind, including an imputed value for leisure. Needless to say, this is far from the case. A convenient way to express the degree of departure from the ideal, for present purposes, is to estimate a marginal cost of public funds, which will be a percentage indicating the added administrative costs, compliance costs, and indirect losses through the misallocation of resources and the distortion of incentives that will result from increasing the level of public receipts. Such a cost will of course vary from one governmental unit to another. Purely as an offhand indication of the orders of magnitude involved, one may hazard the guess that in small units with a good community spirit or in large units operating with a good civil service and efficient administration, under favorable conditions and with low over-all tax levels, it is conceivable that the marginal cost of public funds might get below 10 per cent, while under unfavorable circumstances, say in a corruptly administered medium-to-large city, excessively circumscribed in its taxing powers, the figure might well exceed 50 per cent.

Obviously, it will not pay, on any concept of the public welfare, to carry a marginal cost pricing policy all the way to the limit, so that the last dollar of subsidy barely yields a dollar's worth of benefits to the using public, when the securing of this dollar for the subsidy imposes burdens of more than a dollar. In the simple case where all demands are perfectly independent, the indicated solution is to have all prices exceed marginal cost by a percentage equal to the marginal cost of public funds divided by the elasticity of the demand controlled

by each particular price. Another way of arriving at substantially the same result is to consider prices made up of a base price at marginal cost plus an excise tax. Such excises on public utility rates would receive special consideration as possibly involving lower administrative costs, in the case where their imposition would take the form of the removal of a subsidy that might otherwise be indicated, or where administrative costs would be reduced by reason of the public ownership of the utility. But other than this there would be no justification for higher excise taxes on utility services than on other goods and services.

There is, however, very little to be said for the shibboleth that the rates should be above marginal cost by an amount just sufficient to produce revenues just covering average cost, however this may be defined. To be sure, there are often political and administrative advantages to having operations of a public utility carried on by independent agencies, whether private or public, rather than as governmental departments on a par with other nonrevenue producing agencies of government. It is often argued that this can only be done if the agencies are financially self-supporting. But to me this would be taking a far too defeatist attitude towards our ability to develop appropriate political institutions. Surely the fact that excise taxes are levied on a number of particular products, such as automobiles, gasoline, photographic equipment, and the like, will not be held to have seriously impaired the independence and efficiency of management of these industries, nor, conversely, if for good and sufficient reasons the taxes should be replaced by corresponding subsidies, would one expect the performance to be notably worse. To be sure, abuses occur in the distribution of subsidies, but except where the basis of the subsidy is ill-conceived, these abuses are but the obverse of tax evasion that occurs with excise taxes.

Similarly, if an independent public authority, instead of being required merely to meet its own expenses, is in addition required to turn over to the appropriate governmental unit a stipulated percentage of its gross receipts, either as an explicit excise tax or as an "in lieu" payment, I do not think anyone would imagine that this in and of itself would operate to impair the efficiency and independence of the agency, provided only that the amount is computed in a suitable manner and that the rates and methods of computation are fixed on a reasonably permanent basis. There seems to be no inherent reason why a subsidy cannot be handled in the same manner. There would, to be sure, be a somewhat greater temptation to attach conditions to the subsidy and thus open the door to interference with the independence of the management, and individuals may differ as to the extent to which and the occasions on which this would be desirable. But there is no necessity for this, and if independence is indeed considered a sufficiently impor-

tant objective, there should be no great difficulty in specifying the manner of payment of the subsidy in such a way as to slam the door on such political interference. There need be no greater political bickering over the level of such a subsidy than over the rate of an excise tax.

This is not to say, however, that there are no impediments to the pursuit of a thoroughgoing marginal cost pricing policy by independent agencies. In particular, attempts to adjust prices to variations in marginal cost produced by the installation of large units of capacity or by unforeseen scarcity or surplus may, in the case of a public agency, produce financial difficulties of a sort that may well give rise to demands for revision of the subsidy provisions that would be too strong to resist. Even so, if this breakdown of independence could be resisted and the substantial fluctuations in earnings weathered by appropriate financial measures such as borrowing or the accumulation of reserves, such fluctuations would yield better resource utilization than a policy of keeping earnings as even as possible from year to year.

In the case of a regulated private utility, the incentives that would result from such a short-run marginal cost pricing policy for delaying expansion so as to raise marginal costs and with them the rates that would be warranted and consequently profits, would produce additional difficulties. If to prevent this the regulatory agency is empowered to dictate the installation of capacity, little discretion indeed would be left to private management, even if regulation could be kept from breaking down under the added administrative burden. Thus whether the agency be public or private, it does appear that it would be difficult to preserve political independence and still provide for the variations of rates in accordance with short-run excess or deficiency of capacity.

But whatever the conclusion as to the desirability of actual payment of subsidies, there can be little question that to require utility users to bear tax burdens in addition to paying the entire average costs is undesirable. The situation is bad enough when utilities must pay income taxes, property taxes, and other general taxes on the same basis as other industries. To impose in addition special discriminatory taxes and excises is completely unjustifiable under any but war emergency conditions. A first step in the direction of marginal cost pricing would be the removal of all such discriminatory tax burdens, such as the federal excises on transportation and telephone service. A second step would be the exemption of public utilities from the payment of such general taxes as can readily be abated without creating difficult administrative problems. This would include all in-lieu taxes, as well as property taxes on property improvements and movables specifically designed and used for utility service, and possibly taxes on land as well, though where property such as land is convertible to other uses,

its exemption when normally devoted to utility uses might give rise to incentives for artificially extending the utility operation to cover an unnecessarily large area of land for the sake of extending the scope of such an exemption. Exemption from income taxes raises rather troublesome issues of allocation and accounting where utility companies carry on nonutility activities or otherwise compete directly in subsidiary operations with nonutility companies. But in general there is room for a very substantial step in the direction of marginal cost pricing through tax adjustments without getting involved in outright subsidy. Of course, such a program need not be carried out all the way to the limits suggested by the above considerations if for other reasons it is found desirable to keep prices further above marginal cost than this would make possible. Moreover, this argument would not preclude special taxation of utilities exploiting a scarce natural resource such as water power or natural gas, as a means of retaining for public use the pure economic rent arising in such situations.

Another argument that is often made for avoiding subsidies is that only by requiring customers in the aggregate to pay the full cost of the service can it be made absolutely certain that the service was worth providing. To do this, however, would be somewhat analogous to a playgoer who always rushes home before the end of the last act in order to see whether the TV show that he missed by going to the theater seemed better or worse than the play. Destructive testing is occasionally necessary, but to adopt a policy of applying an injurious test in every case is surely wasteful. Even if only those services are provided that could, it is estimated, pay for themselves, it will ordinarily be far better to operate such services at marginal cost. Even so, policy would err on the conservative side and many worth-while services would fail to be provided because they could not be made to pay for themselves in this way. There is no point in aiming at the wrong target merely because it is easier to tell if you hit it. Moreover, in practice, decisions as to whether to provide a service must be made fairly far in advance with a more or less permanent commitment of capital involved; so that, in practice, whether a service can be made to pay for itself must be estimated in advance and these estimates are almost as uncertain as estimates of whether the service is worth while on an over-all basis. Even if a service cannot pay for itself, this is no indication that it is not worth while. If a mistake is made in such forecasting, marginal cost pricing at least minimizes the resulting waste and salvages what can be retrieved, while an attempt to recover the full costs as nearly as may be often compounds the original error by allowing excess capacity provided in error to remain unused.

Another important consideration to be kept in mind is that marginal

cost pricing will not be adopted everywhere simultaneously, and where closely competing services continue to be rendered at rates substantially above marginal cost, reduction of the rates under consideration to marginal cost might well produce a poorer allocation of resources than somewhat higher rates. Indeed, if the only consideration were the allocation of a given demand between two closely competitive forms of service, the proper price for the service under consideration would be one that makes the differential between the prices of the two services reflect the differential in marginal cost, at least where the application of this principle leads to a unique result. It should be noted that it is an equal absolute differential and not an equal percentage relationship that is sought. This may cause difficulty where the units are not directly comparable, especially where different consumers would have different substitution ratios and discrimination between them is not feasible. For example, if air express rates are to be set so as to preserve the proper cost differential over established surface handling charges, some allowance should properly be made for the lighter packaging that would often be practiced for air shipment, and this allowance might vary considerably from customer to customer.

There may also be several competing services, differing in the degree to which their rates exceed marginal cost. In which case some sort of compromise will be necessary, with the influence of each competing service weighted according to the appropriate cross-elasticity of demand. For example, if rates for water transportation are to be set, it may not be possible to do this in such a way as to cause the rate differentials to agree with the marginal cost differentials for both rail and truck shipments, if the rates for these latter are not to be disturbed. Of course, where a single agency, such as the ICC, has control over the rates of all of the competing services, all of the rates can be adjusted together to a common margin above marginal costs and there is no difficulty in preserving the competitive relationships among the various services whatever the general level of rates decided upon, except possibly where it is necessary to distort the relationship in order to give the agency providing each service a fair return and no more on its investment. In such a case the problem might better be met by the imposition of appropriate discriminatory taxation on one or more of the operating agencies so as to bring their rates into an economical relationship with the highest rather than to permit traffic to be uneconomically diverted because of differing relationships between the marginal and average cost of the several competing services.

Of course, in a general sense every service competes with all other commodities and services for purchasing power and for the use of resources, and it is sometimes claimed that, since imperfect and monopo-

listic competition prevail fairly widely in the private sector of the economy, producing prices considerably above marginal cost on the average, therefore public utility prices should likewise be above marginal cost by a like percentage. This argument must be used with caution, however. At most, the presence in the economy of a substantial sector that appears to be genuinely competitive in the relevant sense would bring the average discrepancy between marginal cost and price down to a more moderate figure than would be thought of if attention is focused primarily on the imperfectly competitive sectors. Moreover, in applying such an argument it must not be forgotten that self-produced commodities and services, not produced through the market, also compete in this way. Such nonmarket production, including the utilization of leisure time, constitutes a very large area where there is no market friction, monopoly behavior, or taxation to drive a wedge between the marginal cost and the marginal value to the individual. Services that compete with such self-produced products would need to be priced particularly close to marginal cost if the best attainable allocation of resources is to be reached.

On the other hand, complementarity relations must be considered, also. It might be desirable to price at less than marginal cost a service that happens to be strongly complementary with services that have established prices unusually far above marginal cost. A somewhat inadvertent example of this is the practice of allowing the use of feeder highways at charges often substantially less than marginal cost, balanced in some instances by the charging of tolls substantially in excess of marginal cost on bridges, tunnels, and the like. Conversely, services that are strongly complementary with leisure or nonmarket production might warrantably be priced further above marginal cost than otherwise. This proposition might be held to indicate higher rates for recreational travel, amusements, and the like, except for the fact that there are also strong substitution relationships to be taken into consideration as well and that accordingly the demand for such services is often highly elastic.

The taking into consideration of complementarity and substitution relationships in the application of marginal cost pricing is thus an extremely complex matter that cannot be reduced to any simple rule of thumb. Except for a few special situations, however, it does not seem that complementarity relationships would in themselves require any but relatively minor modifications of marginal cost pricing practices.

But whatever arguments may be advanced for departing in various degrees from a strict marginal cost pricing policy, no sound pricing policy can be developed without using marginal cost as one of the prin-

cipal determinants. Indeed, while marginal cost pricing has been discussed most frequently in a context of decreasing cost situations and subsidies, marginal cost has an important role to play even where economies of scale are absent and there is no problem of self-liquidating versus subsidized operation. Adequate consideration of marginal cost in the setting up of a price structure often leads to structures quite different from those in general use, wholly aside from the question of the proper general level of rates. Even where economies of scale are substantial, marginal cost considerations may be much more important in relation to the structure of rates than to the level.

To illustrate the structural importance of marginal cost pricing, let us consider the following example. A daily train is to be operated from A to B, and possibly to continue on to C, and return. Constant returns to scale prevail over the range of operations contemplated and costs are of three kinds: 20 cents per seat per day for capital and similar charges on the equipment, independent of the distance operated; 30 cents per seat for operating expenses for each leg of the trip; 10 cents per passenger for each leg of the trip for wear and tear on the equipment, cleaning, and service to passengers. It is assumed that equipment can be found to make the train up to any desired number of seats at strictly proportional costs but that it is impractical to change the consist of the train at B and that if it is to run through to C at all, the entire train must be run. Demand for the AB leg is linear, ranging from 2,000 at a price of zero to a maximum price of $2.00 that the most eager passenger is willing to pay; demand for the BC stretch is one-fourth as great, ranging up to 500 passengers at a zero price, with the same maximum price.

Some simple calculations will show that if the train is operated between A and B only, with the capacity exactly adjusted to the traffic, average and marginal costs are 50 cents per trip, and that at this fare there will be 1,500 riders each way, yielding a total consumer's surplus of $2,250.00 per day for the round trip. On the other hand, if the train is operated through to C, marginal cost for the BC portion of the trip is only 10 cents, since there will inevitably be empty seats, while the marginal cost for the AB trip will be 80 cents, the cost of providing additional seats for this trip having risen because the additional seats, if provided, will now have to be carried all the way to C. At fares equal to these marginal costs, there will be 475 BC passengers, whose consumer's surplus for the round trip will be $902.50, and 1,200 AB passengers, with consumer's surplus amounting to $1,440.00, or a total of $2,342.50. As this is a case of constant returns to scale, we can expect that revenues at marginal cost rates will just meet costs, and this is indeed the case. The net welfare product is thus in each case

the consumer's surplus generated, and accordingly the second mode of operation is to be preferred to the first, and this is, indeed, the optimum mode of operation.

Now in principle, in a case where there are constant returns to scale, it should be possible to allocate costs in such a way as to produce allocated costs identical with marginal cost. And yet I venture to suggest that in a case such as the above the optimum result shown would not be reached by any of the usual cost allocation procedures unaided by marginal cost concepts. The concept of marginal cost cannot be dispensed with as a tool for making cost allocations even in the constant returns to scale case.

To be sure, the above example is a little unusual in that although it is not strictly speaking a case of increasing returns, it is a case where indivisibilities enter through the assumption that it would not be possible to provide the service in two or more trains, with only some of the trains operating through to C. Thus the rather unusual result arrived at would not occur in a case where the production process is perfectly divisible and where accordingly competition is possible. But such cases do occur in varying degrees of complexity embedded in a context of decreasing costs. Yet in many cases the more dramatic results of the application of marginal cost pricing will not be a reflection of the degree of decreasing cost, but rather of the pattern of cost interrelationships produced by the indivisibilities.

Indeed, if the only implication of marginal cost pricing were that in decreasing-cost industries the price structure should be reduced more or less uniformly by a percentage reflecting the amount by which the elasticity of the long-run production function falls short of unity, one might be justified, in many cases, in feeling only a very restrained enthusiasm. For example, studies I have made of the marginal costs for railroad freight service indicate a level in the neighborhood of 80 per cent of average costs, on a long-run basis. Subsidies of the order of 2 billion dollars a year, which would be indicated in order to enable rates to be cut to a marginal cost level, would produce a net gain in national product of some 250 billions, assuming an elasticity of demand of about unity. In view of what has been said above concerning the marginal costs of public revenues, this would seem to have relatively little to promise. Actually, in such a case one could probably rest content with recommending that taxes bearing on freight transportation in one way or another be abated as far as administratively possible.

Passenger service is a somewhat different matter, however. While if we measure output of passenger service in terms of passenger car miles it is possible to arrive at a figure somewhat comparable to that for freight service, this is not the end of the story. The degree to which this

service is actually utilized is positively correlated, to a considerable degree, with the density of traffic: a 10 per cent increase in traffic generally requires an increase of considerably less than 10 per cent in the space that must be provided to give an equivalent quality of service. Moreover, as traffic density increases, the quality of the service tends to increase, in terms of frequency, variety, speed, and sometimes in quality of equipment. Or to put it another way, the fact that passengers will not wait as readily as will freight for the accumulation of trainloads of minimum cost size means that trainloads are generally smaller than would produce a minimum average cost per passenger and thus there are substantial economies of scale from increasing the number of passengers per train to be compounded with the economies of having more trains per year per route. All of this is rather difficult to evaluate, but it seems not impossible to place the marginal cost of passenger service as low as one-third of the average cost, particularly on lines where the density of traffic is fairly low and the average haul short. Some support for the more extreme point of view may be found in Gilbert Walker's figures comparing main line with local and branch line passenger service costs in England, given in an article in the *Oxford Economic Papers* for March, 1953.

It is fashionable in railroad circles to bemoan the present deficit shown for passenger operations as constituting one more unfair burden thrown upon railroad freight traffic, placing it at an improper disadvantage as compared with truck traffic. But if it is true that the elasticity of costs for passenger service is substantially lower than for freight, this would justify a substantial discrimination in favor of passenger service. The existing relation between passenger and freight rates may thus be more desirable, on the whole, than one where passenger service is required to meet all of the costs for which it is incrementally responsible as a whole, to say nothing of a share in the costs that are inextricably joint as between passenger and freight service. Of course, an even better allocation of resources could be obtained if railroad passenger services could be subsidized from general tax funds rather than, in effect, from a special tax on railroad freight service.

In another area, it is often claimed that telephone service is rendered under conditions of increasing rather than decreasing costs. It is claimed, with some justice, that the central office equipment required to furnish interconnections between subscribers increases more rapidly than in proportion to the number of subscribers. Comparisons of costs between large and small communities also seem to indicate increasing costs. But this is not the whole story. Much of the outside plant of telephone companies can be installed, under given outside conditions,

at much lower unit costs at high densities of service than at low; long distance service in particular seems to have a strong decreasing cost characteristic. The economies of scale in the outside plant would seem to be sufficient in most cases to much more than offset the diseconomies of scale in the switching plant. Nor is the urban-rural or large town-small town comparison quite appropriate. While it is true that a large exchange will usually find that the conditions under which the outside plant must be installed are more costly than a small exchange, this is not caused by the size of the exchange but is only an associated condition. Actually, if in some given city such as Detroit, for example, one were to imagine that nine-tenths of the customers taken at random had never installed a telephone, I would be very much surprised if it would have been possible to design and construct a telephone system to serve the remaining tenth of the subscribers at as low a cost per subscriber as is obtainable with the existing pattern of service, particularly if the amount of use per telephone were to be held approximately the same. Moreover, even were it true that costs under given circumstances tended to go up more than in proportion to the number of subscribers, this might be considered offset by the increased value of the service rendered when a subscriber can reach a larger number of other phones in the community. Thus telephone service is by no means to be excluded from the candidates for subsidy if marginal cost pricing is adopted as a general principle.

One of the major characteristics of marginal cost structures is the rather marked variation in such costs as between-peak and off-peak demands, whether the peak be in terms of daily, weekly, or seasonal fluctuations, or even as between congested and uncongested sections of route. In the ideally simple case, where demand is exactly predictable and capacity is a sharp and rigid limit, the appropriate marginal cost price is one which covers only the utilization or service costs as long as demand at that price is below capacity, and which is at other times or places just sufficient to keep effective demand at the capacity level, capacity being in turn adjusted so that the amounts obtained over and above the service costs during such periods of capacity use are just enough to cover the marginal costs associated with an increase in capacity. The marginal cost of a peak period unit may be thought of as the opportunity cost involved in depriving the next most eager consumer of the service, or of a cost arrived at by taking the marginal cost of an increment of capacity and deducting as a credit the excess of the value of all other units of service which the increment of capacity makes it worth while to produce and sell over their respective direct variable costs.

The picture is of course often complicated by the fact that various

different capacity limits often operate on the same service at different times and in different ways. In the very short run, for example, the number of seats scheduled to be operated on a given train may be fixed; with some advance notice, cars can be added or dropped, but perhaps only by shifting equipment from some other service; over a longer period, schedules can be adjusted and eventually adjustments to track layout can take place. The appropriate measure of the peak also varies: where the timing is crucial, as with transit service, limitations imposed by track or roadway capacity operate on the basis of a volume measured over an interval of say five or ten minutes; with respect to the availability of equipment, the peak is determined by integrating over a period equal to the time taken for a round trip, say ninety minutes.

Capacity limits on output of nonstorable services often operate to produce rather drastic fluctuations in marginal costs that are regular and predictable enough to be used as the basis for rate making. For subway service in New York, for example, it has been estimated that the marginal cost of a fairly long rush-hour trip would be on the order of 30 to 50 cents, while a comparable nonrush-hour trip would have a marginal cost of only 8 to 10 cents, and rush-hour trips in a direction opposed to the major flow of traffic would in most cases be a surplus by-product service with a marginal cost substantially zero. Costs per passenger mile will vary equally drastically for different portions of a single trip on a single train. An evening rush-hour trip from Coney Island to Bedford Park in the Bronx would have a zero marginal cost for the Brooklyn portion of the trip, a cost rising to about 5 cents per mile for the upper Manhattan portion of the trip and falling off to 1 or 2 cents per mile for the Bronx portion of the trip.

Capacity limits are, however, not always rigid. The usual way of expressing a somewhat elastic capacity limit is in terms of a more or less sharply rising marginal cost curve. In many cases, however, while the capacity limits on the volume of service offered are quite rigid, elasticity at the capacity limit is provided by impairment in the quality of the service offered. It may not be possible to run more trains or longer trains on a given route, at least in the short run, whether from lack of track capacity or of equipment; an increase in traffic will be accommodated by having a larger proportion of standees, or more intense crowding. Costs to the operating agency may be very little affected, and in this sense one might say that marginal cost is very low; the cost, however, is to be measured in terms of the deterioration in the value of the service to the former passengers. It is not often realized how great a marginal cost computed in this way can easily be. If the addition of 20 passengers to a car already containing 200 passengers creates increased crowding, that the original passengers would on the

average pay 3 cents each to avoid, this is a cost of $6.00 to be divided among the 20 passengers causing it, resulting in a marginal cost of 30 cents each. Or as demand approaches the theoretical capacity, the slack necessary to insure taking care of customers as they apply may vanish, with the result of longer and longer queues or delays in getting service. The queue or the delay may operate to cut down to some extent the demand for service, but in general this will be an inadequate deterrent without substantial increases in the rate as well, since the operative deterrent for the individual is the average delay, not the much greater increment in total delays that will be caused by the addition of one person to the demand: not only will the additional customer have to wait while he works his way to the head of the queue, but all customers after him will have their waits increased by the time required to service the added customer, until such time as either the queue is entirely worked off or some potential customer is discouraged by the increased length of the queue.

In an extreme case where the control of the queue may require diversion of resources from the providing of the service, as for example may occur in some situations in telephone service, overload may even reduce the amount of service that can actually be rendered below what it would have been had demand been more moderate. For example, repeated attempts of thwarted subscribers to place calls may absorb the time of operators or of certain types of common equipment in an automatic exchange such as registers, senders, markers, and the like. Considerable additional complexity of central office equipment is often necessary to prevent paralysis in such contingencies.

Fairly extreme results also tend to occur in poorly controlled situations such as curb parking. Very marked differences in the amount of time which a would-be parker will have to spend in finding a place to park, and also in the distance that he will have to walk to get to his ultimate destination, on the average, according to whether, out of say 1,000 parking spaces in a given area, 999 are, again on the average, occupied, or whether the average occupancy is only 995 or 990. Again, the deterrent to say the 990th parker is only the amount of time he will have to search, and he takes no account, ordinarily, of the added searching time that his occupancy of a space will impose on those who come after. Metering of curb parking space on marginal cost principles would thus require rather substantial fluctuations in the rate per hour as the degree of occupancy fluctuates in the neighborhood of 100 per cent.

In summary, then, marginal cost pricing must be regarded not as a mere proposal to lower rates generally below the average cost level but rather as an approach which implies a drastic rearrangement of the

patterns and structures of rates. Indeed, it is this restructuring of rates that is likely to be the greatest contribution of marginal cost pricing to the improvement of the over-all efficiency of our economy, while the further gains that might be obtainable from the reduction of rates from a self-sustaining level to a marginal cost level, once the pattern of rates has been made to conform as closely as possible to marginal cost, are likely to be relatively small. The issue is thus not primarily one of subsidized versus nonsubsidized operation, though this is still an important issue. The dominant issue is one of whether the pattern of rates should be based on tradition, inertia, and happenstance, or whether it is to be developed by a careful weighing of the relevant factors with a view to guiding consumers to make an efficient use of the facilities that are available.

Perhaps some indication of the outstanding absurdities that occur in present utility rate structures may be worth while in conclusion. For example, in New York a new vehicular tunnel was opened a few years ago from the Battery to Brooklyn. Since it is a new facility and undoubtedly much more easy and pleasant to use than the old East River bridges, it must, forsooth, be made to pay for itself by the imposition of tolls starting at 35 cents, the practical consequence of which is to encourage continued heavy use of the Manhattan bridge for all trips for which that route is shorter than the tunnel, with the result that the streets near the Manhattan end of the bridge are the scene of some of the worst traffic congestion in the city. Marginal cost considerations would call for the collection of a substantial toll on the old East River bridges, at least during hours of heavy congestion, and a smaller toll or none at all for the tunnel, even though this might mean that the users of the bridges might be "paying for" the tunnel.

In suburban railroad service, the lowest fares offered are almost invariably the weekly and monthly commutation tickets used predominantly by commuters who travel almost exclusively in the rush hour when marginal costs are highest; next highest are multiple-ride tickets used by family members, often at the rush hours, but somewhat less frequently so. Users of one-way or round-trip tickets, on the other hand, are more likely to be off-peak or even counter-rush riders with very low marginal cost. Nor can this pattern be defended on the basis of elasticity. The daily commuter rides from almost absolute necessity, in most cases, whereas the occasional trips of other family members are often dispensable trips; further, the use of the family car for such trips is much more often a strong competitor, since the car is then not needed at home, the schedules are less frequent and convenient than in the rush hour, and many persons may be riding together. To be sure, in the long run there is elasticity to the daily commuter traffic in that

the fares influence the decision to move to the suburbs, but even to the extent that this is a significant factor, it will be some weighted average of the commutation and multi-trip ticket that would be the relevant rate to be considered by the prospective suburbanite. Political pressures seem to be partly responsible for this state of affairs: regular commuters have both a sufficient stake and a sufficient appeal to the public sentiments to bring effective pressure to bear on regulatory bodies. Some roads have been of late making tentative progress towards putting in a reduced rate type of ticket good only during the nonrush hours, but the attempt in most cases seems to have been rather half hearted, as the rate offered is usually still higher than that available in the multi-trip family ticket. Marginal cost pricing here would go much further than this and just about reverse the entire pricing structure.

The same delusion often gets a foothold in the local transit field. Philadelphia, probably on the basis of political pleas, has recently adopted a plan for selling strips of ten tickets, good for one week only, which of course are used predominantly by the high-cost rush-hour riders.

The rapid obsolescence of that great American institution, the open-section Pullman car, is in many ways the work of an inefficient pricing policy, itself in large measure the product of inefficient working arrangements between the Pullman Company and the railroads. No serious attempt seems ever to have been made to vary rates so as to balance the demand for upper and lower berths, so that what was and could still be a device for furnishing a satisfactory low-cost service is fast being relegated to the scrap heap.

And so it goes. One may, for various good and sufficient reasons, hesitate to embrace marginal cost pricing in all of its ramifications as an absolute standard. But no approach to utility pricing can be considered truly rational which does not give an important and even a major weight to marginal cost considerations. And when adequate weight is given to such consideration, important changes in present pricing practices will be indicated in many areas.

APPLICATION OF MARKET PRICING FACTORS IN THE DIVISION OF TRAFFIC ACCORDING TO PRINCIPLES OF ECONOMY AND FITNESS

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The basic issue here under consideration would appear to be whether the transportation pricing mechanism, as it now operates, gives recognition to the inherent advantages of each mode of transportation. Does the pricing mechanism guide the traffic to the agency most fit to do the job? The annual bill for services rendered the nation by its regulated carriers reporting to the Interstate Commerce Commission now runs to nearly 20 billion dollars, and to nearly double this if one includes all other for-hire transportation and private trucking. Could a redistribution of the traffic among the agencies of transportation, as effected by pricing, reduce this sum total cost to the economy?

It seems desirable to first look at the economic motivations, principles, and structure of transportation pricing; secondly, to sketch out some of the problems and experiences bearing on the division of the traffic according to fitness and economy; and, thirdly, to try to formulate some working principles for the recognition of inherent advantages in competitive situations.

Definition of Fitness and Economy. It may be said that the shipper who buys transportation services seeks to employ his funds most effectively. He seeks to minimize his total transportation costs; and by total costs is meant the combined total of the carrier's tariff charges and the shipper's own expenses incident to the receipt, delivery, packaging, etc., of the freight. Fitness and economy to him mean rates and services.

Taking the economy as a whole, however, fitness and economy are believed to be achieved when the nation's traffic is so distributed among the agencies of transportation that the aggregate costs for all transportation (including shipper supplementary expenses) are lower than they would be under any other basis of distribution. Taking the nation's transportation plant—rail, highway, water, etc.—substantially as we find it, this objective would be achieved when each shipment is transported by that agency whose long-term out-of-pocket costs to handle it, when combined with an evaluation of the shipper's costs and conveniences (packaging, loading, etc.) produce the lowest sum total expense. The long-term out-of-pocket or incremental costs here imply a period

sufficiently long for changes in traffic volume to have had their full effect on the carrier's operating practices and plant. When the traffic is handled by the carrier with the lowest incremental costs, the portion of the carrier revenues carried down to "contribution" and "net" is maximized and that consumed in the coverage of out-of-pocket costs is minimized, assuming identical rates.

But the shipper knows little or nothing about carrier out-of-pocket costs, and in any event would be guided not by such costs but by the tariff rates which he must pay, factors of service and convenience considered. However, where two agencies of transportation compete, each carrier's effort to find the rate most profitable to itself will normally bring about a set of rate relationships between agencies which will roughly reflect relative fitness and economy. The urge to maximize profits will normally cause the carrier having significantly lower out-of-pocket costs, and hence the greater flexibility in adjusting its charges, to drop its rates to a point where it can get a very large share, if not the preponderance, of the competitive traffic.

Carrier Motivations. Carrier motivation centers around the maximizing of net revenues. Maximizing profits means maximizing the contribution to burden earned from each kind of traffic or, indeed, from separate movements of a given kind of traffic where grounds exist for differentiating one haul from another on the same traffic.

The mental arithmetic the carrier's traffic man is presumed to go through in pricing out each of his "differentiated" transportation services is set out in Table 1. It is merely the application of the universal endeavor of all who sell to determine that level of the price which, volume considered, will be most profitable to themselves. It is explained most descriptively as maximizing the contribution (over out-of-pocket costs), or as the marginal revenue-marginal cost analysis (equating marginal revenues to marginal costs).

It is a matter of arithmetic that when price reductions made to induce new business reach a point where the increase in total revenues resulting from the last few units added does no more than equal the increase in expenses incurred thereby, one has reached the point of diminishing returns. At this point the contribution to overhead burden (be it high or low) is at its maximum as Table 1 illustrates. (See line 6, columns 5, 6, 7.)

This whole proposition was neatly summed up fifty years ago with the explanation that the traffic manager lowers rates whenever it will increase net earnings; i.e., as long as gross earnings continue to increase faster than operating expenses. (A. T. Hadley, *Railroad Transportation* [1900], page 261. The schedule of figures in Table 1 sums up the end product of all the rate-making elements encompassed in the all-inclusive but rather ambiguous terms "value-of-service" or "ability to

TABLE 1

SCHEDULE OF PROJECTED RATES, VOLUME, CONTRIBUTIONS TO BURDEN, MARGINAL REVENUES AND MARGINAL COSTS*

Line	Rates Per Carload	Projected Volume Carloads	Total Revenue 1×2	Total Out-of-Pocket Costs†	Contribution to Burden 3−4	Marginal Revenues per Carload‡	Marginal Cost per Carload§
	1	2	3	4	5	6	7
1	$50	0	$ 0	$ 0	$ 0	$—	$—
2	48	10	480	320	160	48	32
3	46	20	920	640	280	44	32
4	44	30	1,320	960	360	40	32
5	42	40	1,680	1,280	400	36	32
6	40	50	2,000	1,600	400	32	32
7	38	60	2,280	1,920	360	28	32
8	36	70	2,520	2,240	280	24	32
9	34	80	2,720	2,560	160	20	32
10	32	90	2,880	2,880	0	16	32

* For extended analysis of the marginal revenue concept see *Economic Analyses*, Kenneth E. Boulding, 1948, page 526. It is important to note the assumption in Table 1 that added business can only be generated by price reductions, and that because of an assumed inability to differentiate between markets, the rates on all traffic which would move at $48, $46, etc., per carload, must be reduced to maintain uniformity. At rates near $40 to $42 per car the "contribution" to overhead burden (and net) becomes maximized at the figure of $400 (column 5). At a rate of $40 per car, column 1, the marginal revenue of $32 has been equated to (equals) the marginal cost of $32, columns 6–7. At this level the traffic in question does not burden other traffic; indeed, at any rate other than $40–$42 the ability of the traffic to "contribute" would not have been fully exploited, and to that degree, an unnecessary burden would be cast on other business of the carrier. The difficult problem, of course, is the determination of the volume of traffic which one may reasonably expect to induce with any given rate adjustment Were it not for this factor, rate making could be reduced to a combination of cost finding and arithmetic. Obviously, a working knowledge of the variable or out-of pocket costs is necessary These latter are taken as those expenses which are found to vary directly and proportionately with volume at the level of the firm's output most pertinent to pricing for the future. This is basically a matter of cost behavior within the industry. As J. M Clark pointed out (*Economics of Overhead Costs*, 1923, page 223), one can estimate the effect of added increments of business by observing the behavior of costs for a group of firms whose volume of output has been fluctuating over a period of time, or by taking a single period of time, comparing the costs for firms with a wide range of output. The Cost Section of the Interstate Commerce Commission has made wide uses of both approaches (Statement 4–54).

† Computed at $32 per carload.

‡ The marginal revenue is the added total revenue derived from selling one more unit. Thus, divide each increase in revenues, column 3, by the corresponding increase in carloads, column 2.

§ The marginal cost is the added cost incurred in producing one more unit, $32. Thus, divide each increase in column 4 by the increase in column 2.

pay.") Referring to the Act, Table 1 represents an application of the rate making rule, Section 15(a); that is, a giving of consideration to the effect of the rates upon the movement of the traffic. This latter, a basic ingredient of all market pricing, is no doubt inherent in the concept of a just and reasonable rate under Section 1.

Equilibrium Position Toward Which Transportation Rate Structures Tend. The existing rate structure of each carrier or mode of transportation presumably has evolved after much trial and error, through the

so-called "contribution to burden" or "marginal revenue" analysis, as illustrated in Table 1. It is as though the carrier's traffic manager took each piece of traffic and, starting with out-of-pocket costs as a floor, added such margin, considering the responsiveness of the traffic to the rates charged, as would maximize the contribution. The influence of regulation has here been to place such rate ceiling on the traffic with an inelastic demand as is necessary to no more than make the carrier come out whole (including return); also to prevent exploitation of traffic "wedded" to one carrier or one mode of transportation and literally at the carrier's mercy. The end product is subject to "smoothing out" to avoid undue discrimination between competing shippers.

In short, a rate structure tends toward an equilibrium position under which the rates on each commodity having an elastic demand settle to that margin above out-of-pocket costs as will maximize that commodity's contribution toward the overhead burden and the net. (The fully distributed cost concept does not provide a norm for setting the specific level of a rate. Where fixed or joint costs are present, "full costs" represent a philosophically insoluble problem. If arbitrary statistical apportionments are made, they do not reflect shipper response to the rate set.) As the contribution of traffic with an elastic demand is thus brought to its maximum, the burden resting on the remaining traffic having a comparatively inelastic demand is lessened, thus permitting the rates on this traffic also to settle to a lower level than would otherwise be possible.

The rate structure is the end product, in principle, of an endless equating of marginal revenues to marginal costs in each differentiated transportation market. Each class of freight constitutes a separate market which may be further differentiated by areas, directions of movement, or even point-to-point, where the intensity of the demand (volume, intercarrier competition, etc.) differs. Piecemeal breakdowns of markets permit differential pricing; i.e., the fixing of prices to attract specific additional tonnage and net revenue without sacrificing needed revenue on traffic of the same general kind presently moving freely elsewhere. Different ratings on live dry cell batteries from dead batteries is a classic illustration.

As one might expect, the universal application of the principle of "maximizing the net" in a myriad of highly differentiated markets has created an enormous range in the relation of rates to the out-of-pocket costs. Of the 199 commodity classes of rail freight traffic for which the relation of revenues to out-of-pocket costs was available in a 1951 study made by the Interstate Commerce Commission staff, twenty classes moved at rates significantly below (over 10 per cent below) their long-term out-of-pocket costs, nineteen classes moved at or near

out-of-pocket costs (within a range 10 per cent below to 10 per cent above), fourty-four classes moved at rates ranging from 111 to 149 per cent of out-of-pocket, eighty classes at levels 150 to 200 per cent, and thirty-six classes at levels 200 to 300 per cent or higher of out-of-pocket.[1] Revenues on individual commodity classes ranged from 20 to 30 per cent below out-of-pocket to 600 per cent above. Rates on the same commodity might vary from out-of-pocket to near 200 per cent above out-of-pocket depending on the intensity of competition on individual point-to-point movements or different lengths of haul. Revenues averaged 150 per cent of out-of-pocket costs for all carload traffic combined.

Probably the most significant comparisons are those based on the dollar contribution which each class of freight makes toward the overhead burden, for it is this factor which the carrier seeks to maximize.

Some commodity classes produce tens or hundreds of millions of dollars of contribution toward overhead burden and the net (see Appendix). Other traffic creates millions or even hundreds of millions of out-of-pocket losses. The rail passenger-train service accounting deficits, now running to over 700 million dollars, result in out-of-pocket losses estimated at between 400 and 500 millions. The rail less-carload out-of-pocket losses were computed by the Commission's Cost Section at over 100 million dollars in 1952.

In the motor carrier field the range in the relation of rates to out-of-pocket costs is not so extreme, though very substantial variations are to be found. In a southern motor carrier study made by the Commission's Cost Section[2] the revenues on single line minimum shipments within the South ranged from some 70 per cent of out-of-pocket costs on short hauls to nearly 140 per cent on long hauls. They averaged 98 per cent on all single line minimum shipments. In the heavier weight brackets revenues on single line shipments ranged from nearly 100 per cent of out-of-pocket costs to 150 per cent and, in a few instances, to nearly 200 per cent of out-of-pocket costs. The average for all single line and interline shipments was 119 per cent. Similar wide ranges were found in an earlier study (1945) covering ninety-five motor carriers in Western

[1] Based on ICC Statement 7-53, December, 1953. In terms of net ton-miles, a little over 4 per cent of the carload freight traffic moved at charges significantly below (over 10 per cent below) out-of-pocket; 12 per cent of the ton-miles moved at rates within striking distance of long-term out-of-pocket costs (10 per cent plus or minus); 44 per cent at charges 111 to 149 per cent of out-of-pocket; 25 per cent moves at charges 150 to 200 per cent of out-of-pocket; 14 per cent moves at charges 200 to 300 per cent of out-of-pocket; and about 0.5 per cent moves at rates which are 300 per cent or more of out-of-pocket.

[2] Statement No. 2-53, April, 1953. Out-of-pocket motor carrier costs taken as 90 per cent of the following: operating expenses, rents, taxes, and a 5 per cent return on the depreciated investment.

Trunk Line Territory when the traffic was broken down by weight brackets, mileage blocks, individual commodities, and directions of movements. (Supplemental report of the Federal Manager of Motor Carriers Transportation System and Properties.)

The purport of the foregoing is that the marginal revenue concept can produce a very wide range in the relation of rates to costs. On traffic where large out-of-pocket losses are incurred other contributing forces are obviously present.

Incentive Pricing as an Inducement to Economy and Fitness. In approaching the question as to whether transportation pricing, as it now exists, fully exploits the inherent advantages of the various modes of transportation, some useful contrasts can here be drawn between the utilities and the transportation agencies. A major key to the mass markets in electric power and natural gas has no doubt been the wide-scale use of incentive pricing. Block rates, volume rates, and other forms of quantity discounts are widely resorted to. One recalls the forecast of a utility executive that electricity would some day become so cheap that users would not exert the effort to turn their lights off. Perhaps this is far-fetched, but it no doubt represents the spirit underlying the electric power industry's approach to the marketing of its services, and natural gas is not far behind.

The basic motivation in utility pricing is to obtain the fullest possible utilization of existing plant and distribution facilities and, even more important, the far-reaching benefits of an increasing scale of output with its corresponding reduction in unit costs. Such pricing programs rest on a full and complete exploitation of the marginal revenue principle. Utilities not only differentiate between residential, commercial, and small and large industrial consumers, but each customer's consumption is so differentiated (by steps or blocks) as to encourage his maximum utilization of the company's plant and facilities. Even the small household consumer gets lower rates as his use increases.

In the illustration of the application of the marginal revenue concept in transportation (Table 1), the scope of the rate reductions was limited by the fact that any discount given to attract volume consumption was applied "across the board" to all the traffic. This method of attracting volume business is inevitably accompanied by an increasing "erosion" of net revenues on the business already at hand. The end effect in the illustration given was that it became unprofitable to charge less than $40 to $42 per carload even though it would be in the carrier's interest to take on added pieces of business at rates as low as $34 per carload. This would still exceed the out-of-pocket costs of $32 per carload. Referring to Table 1, column 3, the total revenues at $34 per carload totaled $2,720, the out-of-pocket costs $2,560, and the contribu-

tion to burden only $160. Under block pricing, the first ten carloads would continue to pay $48, the next ten $46, etc. The total revenues, if carried through to line 9, would have been $3,280, and the contribution $720. This is $320 more than the $400 economically attainable under a flat unit price of $42 per car.

Generally speaking, the rate problem appears to be one of so differentiating between markets, or users of the service, as not to unjustly injure one shipper in relation to another shipper in a common market. Where the business operations of each are dissimilar or the large shipper is in a position to exercise the advantages of bigness in any event, a failure to differentiate the markets may accomplish little purpose. Rather, it may operate to limit fitness and economy and the full exploitation of the carrier's capacity for mass output with its attendant possibilities for a reduction in unit costs and charges to all users of the service.

The application of block pricing principles in the transportation field is evidenced by the existence of less-carload or less-truckload rates versus carload or truckload rates; also by the application of LTL breakdowns of, say, 0-2,000 pounds, 2,000-6,000 pounds, etc. Beyond the carload or truckload rate level carrier efforts to apply the principle of incremental pricing have taken several forms. In the rail field they include heavier carload minimums, incentive rates which provide a lower charge per 100 pounds on that portion of the carload loading in excess of a given minimum loading, multiple-car rates, trainload rates, differentiation in the commodity itself (fine coal versus other coal), and special commodity point-to-point rates. Fourth Section relief is part and parcel of this market differentiation.

The shipper is under the same pressure to minimize his transportation costs as the carrier is to maximize his net. From his standpoint, the next lower "rate block" beyond the published carload or truckload rates may mean not only the foregoing rate possibilities but a turning to pipelines, conveyor belts, barge transportation, plant relocation, or the operation of the shipper's own highway or water operations. All factors considered, it is believed that in the transportation sector of the economy research has lagged in the application and use of incentive pricing as a means of realizing on inherent advantages.

A Case History—New Automobiles in Interstate Commerce. The recognition of inherent advantages among competing modes of transportation and whether such recognition could be obtained short of the exercise of the minimum rate-making power, were matters in issue before the Interstate Commerce Commission in Docket 28190, New Automobiles in Interstate Commerce. (259 ICC 475. The Commission report follows verbatim as to facts and discussion, the proposed re-

port of Examiner William A. Disque.) The Commission had launched a general investigation into the rates, charges, and practices in the interstate haulage of new automobiles by rail, by highway, and also by water when in conjunction with rail or highway. The rails had made sweeping and drastic rate reductions, particularly from assembly points for relatively short hauls, to overcome a heavy diversion of the traffic to other carriers. Whereas in the early thirties new automobiles had moved at first class, competition had brought the charges down to levels ranging from 30 to 100 per cent of first class, depending upon the severity of truck competition. Such of the rail rates as were below first class were frequently arrived at by deducting from motor charges certain amounts, generally some eight cents, estimated to offset the rail service disabilities.

The record developed that the shipper's routing was governed by the carrier's rates or charges, the shipper's own costs and conveniences (as related to each form of transportation), and even by subjective factors. Aside from rates, the items listed affecting mode of transportation included expedition, overnight delivery, nighttime deliveries, ready availability of service, regularity, dependability, flexibility, low-cost terminal storage, cleanness of automobiles on delivery, promptness in paying claims, and the cost of local haulage and unloading attached to rail movements. The rails sought to be left free to meet their competition and to publish rates necessary to obtain their "share of the traffic." They contended that they had spent millions of dollars in terminals, equipment, and other facilities to develop the traffic and intended to do their utmost to attract and retain all of it they could handle, at compensatory rates no further below a reasonable maximum level than necessary. They held that the Commission's staff cost studies demonstrated that their rates were generally between the out-of-pocket and fully distributed cost levels and could not, therefore, be condemned as noncompensatory (259 ICC 475, 533).

The motor carriers contended that inherent advantages in respect of service should be held paramount to other factors and should not be offset by other carriers through lowered rates. The motor common carriers argued that the time had arrived when the Commission should exercise its minimum rate-making power to save the revenues of all forms of transportation from further depletion; also to prevent the extinction of the motor common carriers. (*Ibid.*, page 530.)

As to contract highway carriers, the Commission noted that General Motors had helped develop seven contract motor carriers which hauled exclusively for it, that each of these seven carriers made its rates based on the transportation conditions under which it operated and without regard to the rates of other carriers (*ibid.*, pages 490-491),

and that these carriers co-operated closely with General Motors almost as if they were departments of its distributing organization. The contract carriers were assured a definite minimum volume of traffic so long as their rates were satisfactory to General Motors, a factor giving them a definite advantage over common carriers whose business was uncertain. These contract carriers felt that their real competition was with General Motors which was capable of setting up a highway transportation organization as a department of its own company.

The Commission found that under the interplay of competitive forces there had gradually evolved a distribution of the automobile traffic among the various modes of transportation which seemed to reflect the inherent service advantages of each agency more than it did the rates for the service. The water carriers held practically all the traffic from Detroit to Cleveland and Buffalo because they provided specialized mass transportation as well as good service at the lowest available rates.

The rails carried the major portion of the long-haul traffic because they provided the best mass transportation readily available for such traffic at lower rates than other agencies, except possibly the coastal and intercoastal water lines. The motor carriers, for very short hauls, had the advantages of generally lower costs, reflected in the lower rates than the other agencies maintained; also the best service. The latter factor, the Commission said, weighed heavily as a competitive factor in the motor carriers' favor within areas of distribution beyond those where their costs were the lowest (*ibid.*, page 555). For example, from the Michigan manufacturing points to Ohio, most of Indiana and Illinois, outside of Chicago, rail transportation of automobiles was virtually nonexistent. The Commission held that unless future rate changes were substantial in amount they would not appear capable of altering in any substantial degree the then existing general distribution of the traffic among the different modes of transportation (*ibid.*, page 539).

As previously noted, the highway common carriers, squeezed by rail rate reductions and contract carrier competition, asked the Commission to exercise its minimum rate-making powers. The Commission denied the application, observing that its minimum rate-making powers had been used sparingly (*ibid.*, page 535); that the application of such powers had been confined to instances in which it had found that a rate was so low as needlessly to sacrifice a carrier's revenue; that methods employed by a carrier to meet competition are primarily a matter of managerial discretion rather than regulation, so long as they are lawful (*ibid.*, page 531); and that "competition often is the process by which the public obtains reasonable rates." (*Ibid.*, page 532.)

The case history of Docket 28190 demonstrates, it is believed, a full-scale application of the contribution or marginal revenue concept to the pricing of the carrier services. It portrays the wide-open operation of market pricing factors in transportation with the fittest mode of transportation taking the overwhelming share of the traffic in the areas where it clearly had the inherent advantages, rates, and services considered. By such division of the traffic, economy and fitness were effectuated with the monetary benefits passed on to the users of the service and to the national economy as a whole. Wasteful transportation (by the less fit carriers) was minimized. Broadly put, the results would seem to be in accord with the national objectives of conservation of resources.

Before terminating this discussion, two additional factors bearing on fitness and economy should be noted. The provision by government of transportation facilities—highways, waterways, and airways, etc.—enormously facilitates entry into the transportation market. To the extent that the rates and charges of the for-hire carriers fail to reflect the economic cost of the public facilities used, their prices are deficient as a test of inherent advantages. Secondly, where heavy out-of-pocket losses are incurred, such as in the rail passenger and LCL services, the imposition of such burdens upon freight traffic seriously affects the carrier's ability to realize on its inherent advantages in the haul of the freight traffic. The rail passenger and LCL out-of-pocket deficits alone require freight rates on the carload traffic which contributes toward such deficits (i.e., more than covers its own out-of-pocket cost) to be 7 per cent higher than otherwise would be necessary to yield the same rate of return.

Summary. From the points developed herein, there may be deduced the following suggested working principles applicable to interagency competitive situations:

1. Fitness and economy are achieved on any given traffic movement when the shipment is so moved as to occasion the lowest sum-total incremental costs (carrier out-of-pocket costs plus shipper supplemental expenses). Carrier rates and services obviously are both involved.

2. The contribution or marginal revenue concept provides a wide scope for differential and incentive pricing through which the inherent transportation advantages of any given mode of transportation may be given recognition, its cost structure considered.

3. Taking the case history of new automobiles in interstate commerce, it appears that market pricing factors when given free play are capable of doing a pretty fair job in dividing business according to fitness and economy, at the same time preserving essential transportation services.

4. Any exercise of the minimum rate-making power by a regulatory agency inevitably results in a "government-created" division of the traffic between the carriers affected. This follows, inasmuch as traffic flow inevitably adjusts itself to any given rate relationship prescribed.

5. The justification for minimum rate orders or restraints would appear to be limited to situations where a "destructive" rate war clearly promises to worsen rather than strengthen the contribution or net revenue position of the fitter mode of transportation, the end result being but to purposelessly shift burdens to other users of the service. A similar problem arises where no one carrier has clear inherent advantages (rates plus service) over another. This situation most often obtains when rail competes with rail or truck with truck. The primary concern here is with the financial soundness of the fitter carrier. Such carrier should not find its net revenues worsened by the operation of the minimum rate authority when compared to that obtainable if price cutting had been allowed to run its normal course.

6. Whenever the "equality of opportunity" concept is invoked by a regulatory agency in the exercise of its minimum rate-making power, this term should be used in the sense of creating an equality of opportunity to fully develop one's economic capacities.[3] The term should not be used, it is believed, in the sense of creating an equal opportunity to divide the traffic or to "keep everybody in business." Minimum rates, if prescribed, should be such as to clearly encourage the traffic to move by the fittest mode of transportation.[4]

The foregoing working principles assume the pursuit of fitness and economy with a single-minded purpose and a minimum of government intervention in the operation of free market forces. There are, however, certain other considerations to be faced, including a reconciliation of fitness and economy with other parts of the national transportation policy.

One practical problem is the adequacy of the information, on costs in particular, upon which inherent advantages as between modes of transportation are determined. Another is the degree of restraint (and respect for out-of-pocket costs as a rate floor) which competing carriers or modes of transportation can be depended upon to voluntarily exercise in their rate cutting. (To the extent that any traffic fails to make the full contribution of which it is economically capable under the marginal revenue concept, it unjustly forces rates upward on other

[3] For a discussion of this theme, see *Big Enterprise in a Competitive System* (Brookings Institution, 1954), A. D. H. Kaplan, p. 40.

[4] In I. & S. 6172, Manufactured Tobacco, Va. and N.C. to Official Points (7/19/54), Division 2 permitted trucks to meet only the rail rate based on 36,000 pound minimum, but not the lower rail incentive rates. This seems to be an important precedent in the recognition of inherent advantages.

traffic upon which the carrier believes it has a monopoly.) The volume of the traffic now being handled at, or below, long-run out-of-pocket costs is disturbing.

Still another issue raised, and one going to national policy, is the consideration which should be given to the need for maintaining some surplus in transportation services and facilities for purposes of defense or simply to sustain some minimum measure of interagency competition. While these and other considerations no doubt are to be weighed, there does not appear to be any reason why they need deter an effective recognition of inherent advantages.

Appendix

U.S. Rail Revenue Contributions Above Out-of-Pocket Costs—1951

Commodity Classes	Aggregate Dollar Contribution Above Out-of-Pocket (U.S. Total) (000)	Revenue as a Percentage of Out-of-Pocket Costs
1	2	3
Individual Commodity Classes		
Soybeans	$ 14,669	215
Soybean oil cake	4,835	127
Lettuce	6,933 Def.*	83
Cattle, calves, single deck	8,954 Def.*	83
Meats, fresh, NOS	19,404	134
Bituminous coal	286,494	135
Ore concentrates	4,112	131
Iron ore	16,702	109
Petroleum crude	598 Def.*	96
Logs, butts, bolts	10,511 Def *	60
Lumber, shingles, lath	110,665	145
Gasoline	14,584	133
Chemicals, NOS	64,258	210
Furnace, slag	493 Def *	96
Manufactured iron and steel	179,997	225
Explosives	72,988	681
Cement, Portland	65,906	213
Liquors, alcoholic	13,167	311
All carload commodities	2,578,356	150
Commodity Groups		
Products of agriculture	266,370	134
Animals and products	38,392	117
Products of mines	424,747	127
Products of forest	119,501	129
Manufactures and miscellaneous	1,677,697	181
Forwarder traffic	51,649	162

* Out-of-pocket loss. Source: Columns 2 and 4 from ICC Cost Section Statement 7-53, December, 1953. Column 2 figures expanded to 100 per cent.

Note: Commodity classes herein selected to illustrate some of the range in the relation of rates to long-run out-of-pocket costs.

DISCUSSION

E. W. Clemens: The distinction between marginal cost pricing as advocated by Professor Vickrey, price discrimination in which part of a firm's output is priced at marginal cost, and multiple-product production in which some few products are priced at or near marginal cost is essentially a distinction of degree and method rather than one of substance. Marginal cost pricing is a method by which production is carried to the point where marginal cost equals demand, the deficit, if any, being made up by subsidy. Price discrimination is a method by which production is carried to the point where marginal cost equals demand, the deficit, if any, being made up by a tax, in a manner of speaking, on those customers whose demand is more inelastic. Multiple-product production likewise tends to carry production to the point where marginal cost equals demand price in some limited number of markets. This is done by the normal management procedure of shifting resources between various products, restricting output on those products with a high inelasticity of demand, reducing prices and increasing output on those products with a high elasticity of demand, and "dumping" any idle capacity on the market by producing some products at a negligible profit margin; i.e., producing at marginal cost. (See E. W. Clemens, "Price Discrimination and the Multiple Product Firm," *Review of Economic Studies*, 1950-51, page 1.) In this connection, I might say parenthetically that Joan Robinson's two chapters on price discrimination represent a much more rational approach to the theory of the firm than the more conventional theories of monopolistic or imperfect competition, particularly since in all probability there is in our entire economy no firm which confines itself to a single product or establishes a single price for its output.

So complex are the production and demand functions that marginal cost pricing schemes seldom involve the establishment of a single price as the theory of Professor Hotelling originally assumed. Vickrey's paper contains numerous illustrations of this. In fact, the theoretical benefits of marginal cost pricing can be attained only under a multiple-pricing system. Thus marginal cost pricing and price discrimination both emerge as multiple-pricing systems. The difference lies in the fact that in one case prices are proportioned to some calculated measure of cost or marginal cost and in the other prices are graduated according to elasticity of demand. Professor Vickrey's method is the first and Dr. Edwards' the second. We thus have four general alternatives to average cost pricing: (1) subsidized marginal cost pricing at a single price, a case that can be ignored, (2) subsidized marginal cost pricing at a series of prices, (3) price discrimination without subsidy, and (4) multiple-product production.

Once this is established, marginal cost pricing does not appear as esoteric as it is sometimes made to appear. It represents the norm rather than a deviation from it. Despite the fact that I have been for a long time making this point, I think that the real problems are not the problems of theory but the practical

problems of application, many of which have been pointed out by Professor Vickrey and Dr. Edwards. Differences in view stem primarily from the differing significance we would attach to the many practical considerations involved.

Some of these considerations can be compressed into the single problem of determining marginal cost. The determination of marginal cost is a complex matter. The blithesome simplicity of Lerner's marginal cost concept in the *Economics of Control* must appear almost fantastic to anyone with the slightest familiarity with industrial techniques. Marginal costs in general and in specific situations are extremely difficult to measure and when calculated can be used only under elaborate and cumbersome assumptions. There is at the outset the problem of the proper units to be used (passengers, passenger-miles, cars, trains, etc.). Proper computation is difficult, notwithstanding Professor Vickrey's ingenious formulas. There is also the problem of the size of the price group. In many instances, the selection of one large enough for administrative economy precludes any of the gains of marginal cost pricing. A primary objective of practical rate making is that of keeping the number of groups as small as possible. There is the problem of joint costs and of the degree of jointness. There is the problem of determining and measuring peak demand (hourly, daily, yearly) and the significance that can be attached to random fluctuations of the peak. There are costs of entry and costs of withdrawal. There is the question of the distinction between short-run, long-run, and various series of intermediate-run marginal costs. Is depreciation a function of time or of use? Is it to be based on the past, present, or future costs? The incidental calculation of expected obsolescense resolves itself into a glorified guess at the future. Conceivably you might also have to guess at future interest rates. There is the problem of the proper share of administrative overhead to be included in marginal cost.

There is another consideration which to my knowledge has not been considered. The marginal customer is the customer who will first abandon service with any unfavorable change in circumstances. Service to this customer requiring the commitment of capital, or the incurring of fixed costs, carries with it a high degree of risk. This risk represents a concealed cost that is commonly ignored. The telephone industry, to which Professor Vickrey alludes as a possible further subject of marginal cost pricing, maintains that increasing saturation of telephone service has greatly increased the risks incident to the telephone industry.

The problems of demand are almost as knotty. Price is not an interpersonal measure of utility and there is question as to how far out of its way society should go to see that the marginal user receives service. One can question the social propriety of taxing citizens in New York to subsidize a deep freeze unit in Tennessee—or for that matter, the Aluminum Company of America, if such is the case. On the other hand, discriminatory pricing, or "maximizing the net," and to a lesser extent marginal cost pricing are established on the implied premise that the customer who needs the service most should be charged the highest price. For example, in the transit industry considerations of both demand elasticity and marginal cost would dictate the establishment of peak-time rates that would be highest for the customers least able to pay.

To some extent, the choice boils down to a price system where costs are recovered from users of service as a group, or from society at large through taxes. The ultimate and comparable incidence of a tax on selected users and a tax on society in general would be difficult to trace. I think it would be generally admitted that the efficiency of tax collection, all factors considered, would be pretty low, and the costs involved might well swallow any of the social benefits of marginal cost pricing. This would be particularly true if marginal costs, properly computed, were only slightly below average costs. Apart from this, discriminatory pricing and true marginal cost pricing appear to the customer as one and the same thing and are subject to somewhat the same afflictions.

The load accepted as the marginal load today may be the peak load of tomorrow. If service is at all uncertain, as it would have to be under strict marginal cost pricing, there would be a high degree of risk attached to any commitment to the service made by either buyers or sellers. Abandonment of service would be difficult without serious disruption of buyer economics. This would constitute an unseen element of marginal cost. Buyers are willing to pay a premium for certainty of supply, and producers will take less with certainty of demand. The administrative costs involved in establishing and administering a multiple-price system are considerable. Discriminatory pricing systems, whether based on costs or on elasticity of demand, create consumer resentment.

Opposition to discriminatory pricing policies may be based on something more than uninformed resentment. They may be injurious to the firm practicing them, to the competitors of that firm, and to the customers of that firm. If the weight of bargaining power rests with customers and particularly if the demand for the product of the entire industry is inelastic, the competitive battle between discriminating firms may ruin all, as in the early history of the railroad industry. If the discriminating firm is powerful, it may by a process of discrimination eliminate its competitors one by one, as the old Standard Oil Company once did. If some customers are larger or more powerful than others, they may ruin their rivals by extorting more favorable prices from price discriminating firms, as shippers have done in the past. These situations in multitudinous form have always been matters for public concern. It would be significant, but not necessarily controlling, that price differentials were or were not justified by costs.

I am not taking a stand against the position of either Professor Vickrey or Dr. Edwards, but I am saying that in almost all instances "other considerations" are more important than either "maximization of net" or "marginal cost pricing." Other considerations (to name only a few at random from many industries) include traffic control, urbanization, national defense, the maintenance of several sources of supply, preserving competition, conserving natural resources, and improving the general social and economic welfare of the community. The application of the marginal cost pricing principle, for example, to the utilization of exhaustible natural resources results in a serious perversion of social policy. The many considerations vary with each situation to such an extent as to preclude establishing general principles except in closely prescribed areas of the economy.

JAMES C. NELSON: Dr. Edwards states that relative economy and fitness within transportation are achieved "when the nation's traffic is so distributed among the agencies of transportation that the aggregate costs for all transportation (including shipper supplementary expenses) are lower than they would be under any other basis of distribution." With that concept of best allocation of resources within transport, I am in agreement. The emphasis here upon the historic problem of transport pricing for social economy echoes the fundamental and long-needed re-examination of that subject which carriers, shippers, the trade press, government agencies, and economists are now conducting both at home and abroad. Much good can emerge from this activity, but it should be recognized that pricing for a best allocation, in addition to dividing traffic according to relative cost and fitness, would also, so far as transport is a factor, have to locate agriculture, industry, markets, and population in such manner that no different locational pattern could reduce aggregate costs of production. (For relevant theory, see Tjalling C. Koopmans, "Optimum Utilization of the Transportation System," *Proceedings* of the International Statistical Conferences, Vol. V, 1947, pages 136-145; and Ralph L. Dewey, "Criteria for the Establishment of an Optimum Transportation System," AEA *Papers and Proceedings,* May, 1952, pages 644-653.)

Critical scrutiny must be given the main theoretical principle mentioned by Dr. Edwards as governing rate making. Carriers seeking to maximize their profits undoubtedly engage in mental arithmetic which, if extended to its logical conclusion, would equalize marginal revenues and marginal costs. Equalizing those things will clearly maximize profits where profits can be earned or minimize losses where profits cannot be earned. Assuming that the carrier's demand curve frequently is not horizontal and at different prices may have different elasticities, the rule urged by Dr. Edwards should receive close attention in pricing or in regulating to maximize profits, at least in the short run. The question which arises, however, is whether that rule is equally applicable in dividing traffic according to relative economy and fitness.

The railroads as a whole have not earned exceptional profits in the current high-level economy and they have returned to an excess capacity condition, particularly in passenger operations. More selective and competitive application of the marginal revenue-marginal cost principle—with its accompaniment in railroading, rate discrimination—might well increase volume and reduce excess capacity and also enhance profitability if care is taken not to quote rates below marginal costs. Assuming that most present rail facilities will be needed, to reduce excess capacity by incremental pricing to the extent that demand proves elastic would bring economy in use of durable and other transport resources to that extent. The added profitability (up to a point) would not seem objectionable in view of the demand for greater cost-reducing investment in improved motive power, special and larger freight cars, terminals for trailers on flat cars, new low-cost passenger trains of the Talgo type, and roadway improvement. Hence pricing effort should not only concentrate on demand as influenced by alternative transport agencies but also upon prices that will fully stimulate cost savings from volume and off-peak shipments.

However, as recognized by Dr. Edwards, whether carriers have adequate

knowledge of demand elasticities and of the behavior of costs to apply such pricing very perfectly must be faced. Though accounting and statistical data are favorable in transport, the long hesitation of the rails to quote truly low coach fares even though demand is elastic suggests that interpreting the demand curve is still fraught with uncertainty and risk.

Of greater concern in the problem at hand are the cases which justify doubt that a profitable application of the marginal revenue-marginal cost principle will always divide traffic according to relative economy and fitness. It cannot be overlooked that the existing traffic division has been influenced by the discriminating rate structure which Dr. Edwards has summarized. Thus, if the traffic division is failing to distribute traffic to the agency with the lowest long-term out-of-pocket costs, it might be well to look at the inducement which high discriminating rates, based on the marginal revenue principle, has offered to traffic movements by high-cost agencies.

After neglecting the discriminating effect in developing his example of how marginal revenue-marginal cost equality leads to a maximum revenue contribution, Dr. Edwards subsequently explicitly recognizes that rate discrimination will continue to result from marginal revenue pricing. In addition to bringing maximum justifiable profits, he implies that such discrimination will protect the existing regional pattern of industry. And he also implies that more enlightened discriminatory pricing may bring about an economic traffic division between road and rail. But does he recognize sufficiently the historical wastes that may in part be attributed to discrimination? And does he examine closely enough the cases where gaining the maximum revenue contribution may conflict with a redistribution of traffic to the low-cost agency?

Dr. Edwards properly notes the significant cases where railroads have been rendering services at less than variable costs; hence unprofitably if the cost assignment procedure is correct. If through improved pricing, new equipment, pooling of services, or more efficient management the unprofitable passenger and LCL services cannot be made to yield revenues above variable costs, they should be abandoned even under marginal cost pricing. So long as passenger trains are operated, every effort should be made to stimulate traffic as marginal cost must be extremely low. But it can be argued that the railroads' continued ability to render important areas of service at a loss and still make a profit on all operations has been dependent upon maintenance of high discriminating rates on important segments of traffic. Had the rate structure been less discriminating, perhaps shippers and consumers might not now have to pay millions additional freight revenues to support unprofitable services and society might have gained through an improved allocation of resources.

The possibilities that discrimination may underwrite an inefficient resource allocation do not end there. It is common knowledge that truck lines, particularly on long hauls, have concentrated on classes of traffic on which railroad rates are far above rail out-of-pocket or even fully distributed costs. Hence, to a considerable extent, the current problem whether to lower rail rates drastically below truck rates to encourage traffic flows by the low-cost agency has its origin in the great faith in discriminating pricing in the rail industry. This does not necessarily give cause for casting out discrimination, but it does raise

doubt that the particular discrimination pattern of the past can solve present-day problems. If there is some model of discrimination from marginal revenue pricing that would both maximize railroad profits up to the point that such profits are required and also shift the traffic between agencies so that it would flow over the least-cost agency more frequently than at present, that pattern should be articulated. (*Ibid.*, pages 144-145 and 648, respectively.)

Viewing the allocation problem as it exists today, the serious pricing questions concern the intimate details of how the low-cost agency carriers can reprice their services to encourage traffic for which their agency is low cost and to discourage traffic for which it is high cost (when rates are unprofitable).

Here, a conflict of interest inevitably arises: It concerns whether low-cost carriers would be better off profitwise without some of the competitive traffic and with high rates on remaining traffic than with all competitive traffic at rates low enough to attract it from the high-cost agency. Considering relative service advantages, it may often require marked reductions of present rates to achieve a shift in traffic to the low-cost agency. But if management thinks it more profitable with high rates and less traffic of a given kind, the profit-maximizing rule does not bring carriage of traffic, in the short or even considerably long run, by the agency with lowest marginal costs. Or if management decides to sacrifice present profits with rates low enough to shift all competitive traffic, then traffic flows by the low-cost agency but at low general profitability unless noncompetitive traffic can stand, and regulatory authorities will permit, very high rates upon such traffic.

One possibility for resolving this conflict is to reduce the low-cost agency's rates on competitive traffic as low as necessary, even as low as short-run marginal cost, and to subsidize low-cost carriers for any sacrificed revenue contribution up to a reasonable level. This method should effectively divert traffic to the low-cost agency except where service considerations are controlling and, if other classes of traffic continued to contribute existing revenues over variable costs, it would hold total subsidies below the level under across-the-board marginal cost pricing. Thus the advantages of some discrimination to minimize subsidy and some marginal cost pricing to facilitate relative economy would be combined. But this scheme has some obvious political and economic frailties. The railroad situation is hardly serious enough for public approval of this type of subsidy. And rates as low as marginal costs might not be required to attract traffic to the low-cost agency. Thus, traffic-diverting rates might make positive but varying contributions toward overhead costs and return. Hence, marginal revenue pricing with reasonable discrimination might be preferable after all—but only where it succeeds in shifting traffic to the low-cost agency.

The recent selective rate reductions suggest that in certain cases railroads must assume that enough traffic has been lost that it may pay them to reduce rates sufficiently to regain the traffic. In those cases, the demand curves faced by them may be horizontal down to a price under the high-cost agency's lowest price that will effectively divert the traffic. If the traffic-diverting rate is still above variable cost, it may pay the low-cost agency to lower rates and adhere fully to relative economy pricing. Below the traffic-diverting rate, low-

cost carriers might select rates that maximize the net above variable costs. But what about the many competitive situations in which railroads have not acted to reduce their rates drastically, such as in transcontinental markets with respect to high-rated manufacturers? Here traffic diversion mounts—on long hauls where mass carriers are thought to experience lower costs. Presumably it is not profitable for railroads to stop that diversion, though in time diversion may have a disastrous effect upon their traffic and profitability. In this difficult situation, the devil gets you if you do and he gets you if you don't!

It seems questionable that public support will develop for sufficient restriction of for-hire and private trucking to protect the security of the railroads in the numerous situations where they still carry such a large share of competitive traffic that it is more profitable to continue present discriminatingly high rates than to reduce them to stop diversion. Thus, it may pay the railroads to consider going all the way to a rate system that fully reflects their cost advantages and disadvantages in their rates. Professor Gilbert J. Ponsonby has proposed such a policy for Great Britain, where the railways have been freed of all regulation except maximum rates. Briefly, his proposal is that carload freight be quoted, regardless of commodity, a flat rate per car-mile (recognizing differences in cost occasioned by size of cars, etc.) plus a flat terminal handling charge per car irrespective of distance. Under this plan, rates would still taper and rates on light-loading commodities would be high and those on heavily-loading goods would be low. But discriminatingly high rates would no longer invite truck competition on dense routes where rail costs are lower and would no longer make it possible for rails to continue unprofitable services on light routes and over short hauls where truck costs are lower. Professor Ponsonby doubts that marginal costs are low enough under average costs to make low discriminating rates profitable except in joint-cost cases of return hauls and off-peak travel. He believes such a simplified rate system would automatically shift traffic in accordance with relative economy and fitness and that railroads would still command adequate traffic volumes to operate profitably and at satisfactory utilization rates ("Towards a New Railway Charges Policy," *Journal of the Institute of Transport*, September, 1954, pages 427-433).

This sweeping junking of historic policies may be regarded as too drastic for this country where regional economies have been built upon low value-of-service rates. And some economists will argue that adoption of cost rates would reduce utilization to unprofitable levels even in a growing economy. But at a time when traditional pricing and regulation is under attack and after years of muddling without a solution to the relative economy and fitness problem, it would seem appropriate to consider all major alternatives. (See the comment on page 27 of the *Railway Age*, November 29, 1954, that the Ponsonby "proposal is one that certainly has enough merit in it to warrant a lot of study and discussion.")

Whatever rate policy emerges, vigorous action on several fronts is essential. Otherwise, railroads may face the bleak prospect of continued traffic erosion, higher unit costs from underutilization, higher rates on traffic still wedded to the rails, eventual diversion of that traffic and a continual repetition of that vicious circle, with dismal long-term disinvestment and unprofitability effects.

Fortunately, some encouraging signs of rail action to avoid this outcome exist, such as the selective rate reductions under way, the rapid introduction of trailer-on-flat-car pricing (flat rates on trailers reflecting the rail cost advantage for line hauls), interest in low-cost passenger trains, and improvements in cost control. In addition to such moves, the public must be prepared to have government do its part by assessing adequate user fees for all public transport facilities, by reasonably adjusting regulatory standards, and by insisting upon allowing transport markets to do their important allocation work.

With Dr. Edwards, I believe that rivalry is sufficiently vigorous and widespread that the inherent advantages of all agencies will get a real working out under the competitive organization of transport. Unless a case can be made for the transport company approach, there can be no turning back from recent market developments, only a more enterprising prosecution of market factors—both cost and demand—in pricing.

AMERICAN ECONOMIC ASSOCIATION

PROCEEDINGS

OF THE

SIXTY-SEVENTH

ANNUAL

MEETING

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DETROIT, MICHIGAN

DECEMBER 28-30, 1954

PROCEEDINGS OF THE AMERICAN ECONOMIC ASSOCIATION

ANNUAL BUSINESS MEETING, DECEMBER 30, 1954
HOTEL STATLER, DETROIT, MICHIGAN

The Sixty-seventh Annual Business Meeting of the Association was held in the Wayne Room, Hotel Statler, December 30, 1954. The meeting, which was well attended, was called to order at 5:00 P.M. by President Simon Kuznets. After his introductory remarks, outlining the order of business, Professor Kuznets called for the approval of the minutes of the business meeting of December 30, 1953, and the ratification of the Executive Committee actions and acceptance of the reports of the Association's officers and committees, all of which are published in the "Proceedings." A formal vote of approval was passed.

The chief events of the year and major activities of the Association as well as the financial operations, investment holdings, and present status of the Association's finances were presented by the Secretary-Treasurer, James Washington Bell, and his report was accepted.

The Managing Editor of the *American Economic Review*, Bernard F. Haley, summarized the work of the Editorial Board and the Editorial Office in producing the *Review*. He noted some of the many problems concerning the size and contents of the *Review* and again called attention to the usefulness of his panel of advisers, whose names appear at the end of the Report of the Managing Editor.

Only the work of two committees was selected for presentation at this meeting; namely, that of the Committee on Economics in Teacher Education and the *Ad Hoc* Committee on the Implementation of the Bowen Report. Because these matters are of general concern to our members, the business meeting was considered an appropriate time to publicize them. A brief discussion of the relation of the Association to economic education from the floor followed the presentation of these reports. Brief mention was also made of matters relating to the status of the profession. Academic freedom in its various aspects continues to be of concern to the officers of the Association. Attention is being given to the subject of freedom of teaching, research, and publication.

Information concerning the work of committees may be found in comments in the Secretary's Report or reports of the committee chairmen. Reports of officers, committees, and council representatives are printed below, as follows: Reports of the Secretary (page 646); Treasurer (page 659); Finance Committee (page 662); Auditor (page 665); Managing Editor (page 671); of the Committee on Research and Publications, Simeon E. Leland, Acting Chairman (page 675); of the Committee on the Status of the Profession, I. L. Sharfman, Chairman (page 677); of the *Ad Hoc* Committee on Economics in Teacher Education, B. W. Lewis, Chairman (page 685); and of our representatives to the International Economic Association, H. S. Ellis (page

687), the Social Science Research Council, G. W. Stocking (page 689), the American Council of Learned Societies, F. H. Knight (page 692), and the National Bureau of Economic Research (page 694).

The Secretary reported that a preference ballot was being circulated with the membership dues bills, asking members to express their choice of time and place of future meetings beyond those presently committed.

The Committee on Elections report and the certification of the election of new officers for the year 1955 were presented by the Secretary, as follows:

I hereby certify, in accordance with the bylaws on election procedure, the results of the recent balloting and present the reports of the Nominating Committee and the Committee on Elections.

The Nominating Committee, consisting of Morris A. Copeland, Cornell University, Chairman, Howard R. Bowen, Williams College, Mary Jean Bowman, University of Kentucky, Ewan Clague, Department of Labor, Martin R. Gainsbrugh, National Industrial Conference Board, and William J. Fellner, Yale University, presented to the Secretary the list of nominees for the respective offices:

For President
John D. Black

For Vice-Presidents
Earl J. Hamilton
Abraham D. H. Kaplan
Paul A. Samuelson
George W. Terborgh

For Executive Committee
Milton Friedman
Everett E. Hagen
Ruth P. Mack
Lawrence H. Seltzer

The Committee on Elections (Frank G. Dickinson, American Medical Association, Chairman, S. Morris Livingston, Standard Oil Company, and James Washington Bell, Northwestern University) prepared biographical sketches of the candidates and ballots were distributed early in November. The canvass of ballots was made on December 13, 1954, and the results were filed with the Secretary.

From the report of the Committee on Elections, I have the following information:

Number of envelopes without names for identification	52
Number received too late	24
Number of defective ballots	—
Number of legal ballots	2,879
Number of returns from the mail ballot	2,955

On the basis of the canvass of the votes cast, I certify that the following persons have been duly elected to the respective offices:

President (for a term of one year)
John D. Black
Vice-Presidents (for a term of one year)
Earl J. Hamilton
Paul A. Samuelson
Members of the Executive Committee (for a term of three years)
Milton Friedman
Ruth P. Mack

The results of the election having been announced, retiring President Kuznets presented President-elect John D. Black, who responded with brief remarks. He expressed appreciation of the great honor and also of the heavy responsibility of this office. He remarked that his predecessors had set high standards of accomplishment and that only one with a strong sense of duty and obligation could hope to do as well in making the work of the economist important and useful in the world. Referring to his own field of specialization,

he reminded us that he will be the fourth president who has also served as president of the American Farm Economic Association, the others being T. N. Carver, E. G. Nourse, and J. S. Davis.

The lateness of the hour prevented discussion of any new business from the floor, and President Black called for the final item on the agenda; namely, the Report of the Resolutions Committee. The resolutions which follow were read by Professor Blodgett and were approved unanimously:

The Association is greatly indebted to President Simon Kuznets, who bore the major responsibility for the preparation of the program of this annual meeting, and to the members of the Executive Committee and all others who so ably assisted him in this difficult and time-consuming task.

The Association expresses its thanks to Edward L. Cushman, Chairman, and Ruth C. Barnes, Secretary, of the Committee on Local Arrangements, and their several associates on this committee for their effective attention to the innumerable technical and practical problems associated with the holding of this large gathering. Special appreciation is also due to the various local institutions and agencies, governmental and private, including the Automobile Manufacturers' Association and General Motors Corporation, for their most helpful assistance in making arrangements for these sessions. The Association is grateful to the management and personnel of the Statler Hotel for ministering to the comfort of the delegates and visitors to these meetings and to the press and other agencies of communication for their coverage of the proceedings.

Acknowledgment is also made of the co-operation of the ten other professional organizations, meeting simultaneously in this city, in the making of a co-ordinated and constructive joint program.

Finally, the Association extends its sincere thanks to its able Secretary, James Washington Bell, and his staff for their continued and effective contribution to the arrangement of the annual meetings over many years.

Ralph H. Blodgett, *Chairman*
Archibald M. McIsaac
James C. Nelson

The meeting was adjourned at 6:00 P.M.

JAMES WASHINGTON BELL, *Secretary*

REPORT OF THE SECRETARY FOR THE YEAR 1954

The official acts of the Association during the year are recorded in the minutes of the Executive Committee. These are presented herewith, followed by a summary of the year's operations and activities, with comments and interpretations.

MINUTES OF EXECUTIVE COMMITTEE MEETINGS

1. Minutes of the spring meeting held in Rye, New York, April 2-3, 1954:

The *second meeting* of the *1954 Executive Committee* was held at the Westchester Country Club, Rye, New York, April 2-3, 1954. The following were present: Simon Kuznets, presiding, and J. W. Bell, Roy Blough, K. E. Boulding, Gerhard Colm, B. F. Haley, L. R Reynolds, Arthur Smithies, and G. J. Stigler. Absent were: N. S. Buchanan, C. B. Hoover, J. H. Williams, and D. M. Wright. Attending as members of the Nominating Committee were: H. R. Bowen, M. J. Bowman, Ewan Clague, M. A. Copeland, and W. J. Fellner (M. R. Gainsbrugh absent); and as guests, Pendleton Herring, F. H. Knight, and J. P. Miller.

1. *President's Remarks* (Simon Kuznets). The meeting was called to order at 10:00 A.M. Professor Kuznets outlined the agenda and the procedure to be followed.

2. *Minutes.* The minutes of the December 28 and 30, 1953, meetings were reviewed and, with minor corrections, were approved as presented in page proof.

3 and 4. *Reports of the Secretary, the Treasurer, and the Finance Committee* (J W Bell). Although the final report of the Local Arrangements Committee had not yet been received, enough details were at hand to enable us to appraise the results of the Washington meeting. Attendance was especially large. All available facilities were taxed to the full, and despite a little friction here and there, the arrangements proved highly satisfactory. Financial results exceeded expectations. Our experience was reviewed in the light of the prospective problems we face in planning the Detroit meeting.

Membership statistics were discussed and some concern was expressed at the regressive or flattening-out character of these figures, for both members and subscribers. The Secretary presented possible explanations of these curves. Our exchange and complimentary lists were reviewed and the Secretary's proposal to revise our complimentary subscribers list was approved.

The *Papers and Proceedings* volume for May, 1954, promises to be even larger and costlier than last year's volume. Plans were discussed for publishing an annual supplement to the *Handbook* and for a revised *Directory* in 1955 or 1956

The financial results of the "Readings Series" and other sponsored publications were reported, and the Secretary was authorized to go ahead with plans to co-operate with Richard D. Irwin, Inc., in disposing of surplus inventory of Volumes I-V of the "Readings Series."

There were no significant changes to report in financial conditions since December nor in our investment portfolio. At present, we are in a strong cash and investment position

A summary of committee activities indicated the status of standing and *ad hoc* committees upon which reports were forthcoming or, in the case of committees which have been discharged, where action might be called for.

5. *Report of the Managing Editor* (B. F. Haley). Professor Haley spoke briefly about the work of the Editorial Board, the flow of manuscript, the exchange list, and his plans to use foreign correspondents. He submitted a panel of names from which two appointments are to be made at the December meeting to fill the vacancies that will be created on the Editorial Board by the expiration of the terms of J. S. Bain and H. M. Somers.

6. *Reports of Standing and Special Committees.*

6a) *Research and Publications* (J. P. Miller). The following items, which had been taken up by this Committee at a meeting held in New York City, March 28, were discussed and where action was taken, it is so indicated:

Progress was reported on the fiscal policy volume of the "Readings Series" (Arthur Smithies and J. K. Butters, Editors).

The William Jaffé translation of Walras is now in the hands of the printer and the English edition should be out soon. The American edition will be announced for fall distribution.

The Committee recommended that the George Allen & Unwin, Ltd., proposal to undertake the translation of Silvio Gesell's *The Natural Economic Order* be rejected. The Academic Reprint proposal of joint sponsorship of a reprint of the Hull edition of the *Economic Writings of Sir William Petty* was also rejected. It was agreed that such a reprint of Petty would be desirable but that the market would not justify our becoming financially involved.

Proposals to compile economic bibliographies were considered, and there was agreement with the Committee's conclusion that general bibliographies should not be undertaken but that exceptions might be made for special bibliographies in connection with other projects sponsored by us; for instance, in connection with the proposed project on economic growth and development (see below).

On recommendation of Professor Miller's Committee, it was agreed that the Executive Committee authorize the preparation of a review article on bibliographical sources for research in economics which would be published in the *American Economic Review*, either as an article or a supplement. Reprints of this annotated "bibliography of bibliographies" would then be made available for the use of librarians and graduate students. An honorarium of $300 was appropriated to be used if necessary in order to get this job done.

To facilitate the use of the *American Economic Review* and the *Papers and Proceedings*, the Committee recommended that a cumulative index, by author and subject, of Volumes I-XLIV be prepared and that we contemplate future cumulative indexes every decade or so. The Committee was asked to draw up plans and estimate costs of this project, with the aid of B. F. Haley.

A proposal that the Association embark on a series of republication volumes on economic growth was discussed at length and the consensus seemed to be that the Committee be encouraged to reformulate its proposals, not along the line of publishing a series of six volumes, but of presenting a prospectus of one volume of readings or possibly two. This proposal, in effect, would widen the purposes of the Committee in that it involves not only the encouragement of research efforts but their direction as well. The Committee was asked to report a detailed plan for presentation at the December meeting.

In connection with the operations of the SSRC, Professor Miller and Dr. Pendleton Herring reported that the small research grants program for which Ford Foundation support was sought had become part of a larger move, involving the several social sciences. Also, the proposed handbook on the use and application of empirical techniques in economic research is now a project of the Agricultural Committee of the SSRC.

New appointments to the Committee were made as follows: R A. Gordon, to succeed G. W. Stocking (term, 1955-57); M F. Millikan, to fill the vacancy due to expiration of S. E. Leland's term (term, 1954-56); and Alexander Gerschenkron as an additional member of the Committee (term, 1954-56).

An additional sum of $500 was appropriated for operating expenses of the Committee.

6b) *International Co-operation; the IEA* (Gottfried Haberler). A communication from Howard S. Ellis was read. Professor Ellis, President of the IEA, requested the Association's recognition of an IEA-UNESCO volume on *Recent Trends in Economics*, embracing five or six essays prepared by representative authors familiar with trends of economic research in their respective countries Under pressure for prompt action, Professor Ellis invited Rutledge Vining, of the University of Virginia, to prepare the essay on recent trends in economics in the United States. He did this in consultation with colleagues accessible at the time and now asks the officers of the AEA to express their approval of the selection of the author and requests, furthermore, that the President of the AEA write a short introductory note to this essay. No formal action was taken on this request, but the Secretary was instructed to write Professor Ellis, suggesting that his appointment of the author of the essay in this volume is in keeping with the implicit powers delegated by the Association to its representative to the IEA but that the preface to the article be revised so as to indicate merely that the author has been selected by the President of the IEA and the AEA delegate to that organization on his own judgment and responsibility.

The IEA-UNESCO sponsored report, *Teaching of Economics*, should soon be ready for distribution.

It was VOTED to ask a small *ad hoc* committee to prepare an appraisal of the activities of the IEA and of the AEA's participation in the international organization and report its findings to the Executive Committee at its next meeting.

It was VOTED to continue for another year the annual support of the IEA in the amount of double the annual dues; namely, $400.

The next IEA conference will be held at Seelisburg, Switzerland, in August-September, 1954, and the subject will be on wages. L. G. Reynolds, J. T. Dunlop, and Clark Kerr have been invited to attend.

The method of selection of AEA representatives to IEA was discussed. The general sentiment seemed to favor a year-to-year appointment rather than the six-year terms provided for in the IEA charter, but since the appointment of alternates is already provided for, no action was deemed necessary. (See *Papers and Proceedings*, May, 1950, page 594.)

6c) *Honors and Awards* (N. S. Buchanan). No formal report was received from the Committee. After a protracted discussion of the problem of selecting candidates for the J. B. Clark award, it was agreed that we should ask the Committee to reconsider its procedure and it was suggested that sufficient preparation be made in advance of their December meeting to enable them to complete a panel of nominees from which definite recommendations can be submitted to the Executive Committee at the time of its spring meeting in 1955. No award will be made in 1954, and the next award will follow the original schedule.

Professors J. Douglas Brown and Jacob Marschak were selected to succeed Professors G. L. Bach and E. S. Shaw at the expiration of their terms at year-end, 1954.

6d) *Foreign Honorary Members* (W. W. Leontief). No report was submitted by this Committee at this time. With a maximum limit of twenty-five foreign honorary members and twenty incumbents, there remain five vacancies. The Secretary was instructed to ask the Committee to submit the list of names under consideration, together with data concerning qualifications, in case they have no definite recommendations to make at our next meeting.

6e) *Nominating* (M. A. Copeland). At 8:30 P.M. the Executive and the Nominating Committees were constituted as an Electoral College. The report of the Nominating Committee was presented by Professor Copeland. After considering and agreeing upon the nominee for the presidency, the Secretary called and got acceptance from the candidate over long distance telephone. The panel of candidates for nomination to office for vice-presidents and members of the Executive Committee was considered and appointments were made of our representatives to ACLS and SSRC. It was ordered that the whole slate be published in the June number of the *American Economic Review*.

7. *Reports of Council Representatives.*

7a) *ACLS* (F. H. Knight). Professor Knight was selected for another four-year term as our representative. Time did not permit full discussion of the recent meetings of the Council and the Conference of Secretaries (held at Rye, New York, January 20-22). No significant changes in policy or new events need be added to the report submitted and published in the "Proceedings."

7b) *SSRC* (J. P. Miller). In addition to the report of Professor Miller, who described the routine operations of the Council and activities of its more important committees, we listened to Dr. Pendleton Herring describe plans and prospects of the Council, especially the Ford Foundation subsidized summer session training institutes and Rockefeller Foundation faculty research program. R. A. Gordon was selected to succeed G. W. Stocking upon the expiration of the latter's term at year-end 1954.

7c) *NBER* (J. H. Williams). No report.

8. *Annual Meetings.*

8a) Invitations for our 1956 and 1957 meetings were received from practically all large cities in the central and eastern states It was VOTED to meet in Cleveland, December 27-30, 1956, and in Philadelphia, December 27-30, 1957.

8b) The problems of local arrangements for the Detroit meeting were briefly discussed Among these problems are the degree of jointness or independence of our meetings, program, registration, exhibits, advertising, and the use of the US Employment Service again this year.

9. *Miscellaneous and Unfinished Business.*

9a) After listening to H. R. Bowen and J. P. Miller and the Secretary report on the Association's activities in relation to economic education, it was agreed that we should appoint an exploratory group (H. R. Bowen to suggest names) to study and report on continuation projects suggested by the reports on graduate training in economics, undergraduate teaching of economics, and our activities in co-operation with the Commission on Economics in Teacher Education.

Arthur Smithies, responding to President Kuznets' request in December, reported on the petitions recommending certification of economists. He read a number of letters in answer to his questionnaire and on the basis of this evidence recommended no action by our

Committee. No action was taken and the letters were filed with the Secretary.

9*b* and *c*) The Keezer *ad hoc* committee report recommending that a committee on public issues be not reconstituted was taken up along with the Wilcox report on the freedom of teaching, research, and publication in economics. President Kuznets agreed to follow up the latter committee's recommendation that a standing committee be appointed on the status of the profession, with a charge that it prepare an annual report which might involve not only questions of academic freedom and loyalty oaths but also representations on public issues and all other matters considered appropriate.

10. *New Business.* The balance of the meeting was devoted to the preparation of a preliminary draft of the program for the 1954 meeting.

The meeting was adjourned at 12:30 P.M., April 3.

2. Minutes of the Christmas meetings held in Detroit, Michigan, December 28 and 30, 1954:

The *third meeting* of the *1954 Executive Committee* was called to order at 10:00 A.M. at Hotel Statler, Detroit, December 28, 1954, Simon Kuznets presiding. Others present were: J. W. Bell, Roy Blough, Gerhard Colm, B. F. Haley, C. B. Hoover, L. G. Reynolds, and Arthur Smithies. Also present, as guests, were: J. D. Black, Ruth Mack, G. L. Bach, F. H. Knight, S. E. Leland, I. L. Sharfman, and G. W. Stocking. Absent were: K. E. Boulding, N. S. Buchanan, G. J. Stigler, and D. M. Wright.

The *first meeting* of the *1955 Executive Committee* was held on December 30, at 6:00 P.M., with President J. D. Black presiding. Others present were: J. W. Bell, Gerhard Colm, B. F. Haley, C. B. Hoover, and Simon Kuznets. Attending, as guests, were: Roy Blough, B. W. Lewis, L. G. Reynolds, and F. H. Knight. Absent were: N. S. Buchanan, Milton Friedman, E. J. Hamilton, Ruth Mack, P. A. Samuelson, G. J. Stigler, and D. M. Wright.

The account of the proceedings given below does not follow the chronological order of business but treats the sequence of items as they were listed on the agenda.

1. *President's Remarks* (Simon Kuznets). After the meeting was called to order, the items on the agenda were outlined and rearranged so as to take up first those matters representing business that should appropriately be acted upon by year-end 1954, leaving others on the table for consideration by the 1955 Executive Committee.

2. *Minutes.* The minutes of the April 2-3, 1954, meeting, held at the Westchester Country Club in Rye, New York, were approved, with minor corrections, in the form in which they had been distributed.

3 and 4. *Reports of the Secretary-Treasurer, the Finance Committee, and the Auditor* (J. W. Bell). Excerpts from the Secretary's Report were presented, summarizing the chief activities of the year and outlining the status of operations in progress; i.e., the annual meeting, publications, special projects, reports of committees and of council representatives. The Secretary was asked to report at the spring meeting his plans for a revision of the next *Directory*.

The financial condition of the Association was described. Several items on the summary statements of income-expense and balance-sheet accounts which were distributed called for explanation and discussion. Our investment holdings were reviewed, changes made during the year were explained, and our investment policy was discussed. Copies of the Auditor's Report were distributed for examination. Details of financial and investment operations may be found in the reports published below.

Present incumbents of the Finance Committee (Messrs Osgood and Farnham) were re-elected for another year, as were the auditors, David Himmelblau & Co. The vote instructed the Secretary to extend to these members an expression of confidence and warm appreciation of their helpful services.

A resolution was VOTED to renew authorization of power to buy and sell securities on the part of the Secretary-Treasurer as nominee of the Association. The purpose of this resolution was to bring up to date an action taken March 21, 1936.

5. *Report of the Managing Editor* (B. F. Haley). A report was presented (see below) from which certain items were submitted for discussion; i.e., the flow of manuscripts and the size and content of the *Review*, reviews of foreign books and the use made of foreign correspondents, aid sought from a panel of members to relieve those on the Editorial Board. Without formal vote, there was uniform expression by members of the Executive Committee favoring more latitude in the use of the Editor's discretion in enlarging the size of the *Review* some twenty to thirty pages. Such expansion would permit more pages for articles and reviews of selected foreign books.

The appointment of Carl Kaysen and R. B. Goode for three-year terms was APPROVED. They succeed J. S. Bain and H. M. Somers, whose terms expire.

6. *Reports of Standing and Special Committees.*

6a) *Committee on Research and Publications* (S. E. Leland, acting for J. P. Miller). The Committee met in New York City March 28, 1954, and again during the annual meetings at Detroit. S. E. Leland summarized the status of our publication projects, i.e., the "Survey," "Readings," and "Translation" series, and outlined projects under consideration by the Committee (see report below). He reported that a bibliographical article for the *AER*, authorized at the April meeting, has been commissioned and that the Committee is studying B. F. Haley's helpful estimates on publication costs of a cumulative index of articles and papers of the AEA, 1911 to date. New proposals for a *Survey* Volume III on methodology or economics in action is under consideration, as are subsequent volumes in the "Translation Series." William Jaffé's project on the life and works of Walras was discussed.

At the present time, there is a balance of $644.74 available for the work of this Committee, plus the $300.00 appropriated for the economic bibliography article.

6b) *Ad Hoc Committee on Economics in Teacher Education* (B. W. Lewis). A brief report (see below) was read, describing the activities of this Committee and recommending that this Committee be continued as an *ad hoc* Committee on Economic Education and be instructed to prepare for the spring meeting recommendations on the need for and character of the appropriate scope of action by the Association on the different levels of education. The report was accepted with the deletion of "the teaching of economics at the college level and" in the last paragraph.

6c) *Committee on International Co-operation* (Gottfried Haberler); *International Economic Association* (H. S. Ellis). Due to exigencies beyond control, no reports were received from either Gottfried Haberler or H. S. Ellis. Our relations to the IEA were discussed and those present who had attended conferences of the IEA gave their appraisal of the value of these sessions and of the work of the IEA. Although no action was taken, it was agreed that our relations to IEA should continue as in the past but that our organization set-up should be revised, at least so far as our representatives are concerned. These members are appointed for six-year terms but in practice *ad hoc* representatives are selected from members who happen to be in Europe at the time. It would seem more logical to appoint delegates to special meetings. Action was delayed, pending receipt of report from H. S. Ellis, and it was suggested that copies might be prepared for circulation before the spring meeting if organization matters were considered in the report. The report, subsequently received and published below, indicates that the size of the IEA Council has been reduced and that the AEA is to select but two instead of four representatives and recommends that two of its present four representatives be appointed alternates rather than members and that thereafter only two members be appointed.

6d) *Committee on Honors and Awards* (N. S. Buchanan). G. L. Bach, reporting in N. S. Buchanan's absence, explained that the difficulties encountered by last year's Committee in submitting recommendations for honors and awards could not be resolved without reviewing the whole question of the desirability of making such grants at all. The Committee was asked to continue its work, perhaps reviewing the Slichter report published in the 1945 "Proceedings." When the awards were originally instituted, such misgivings as the Committee now holds were exhaustively discussed. The chairman will be expected to attend the spring meeting and report recommendations of the Committee on Honors and Awards.

6e) *Committee on Foreign Honorary Members* (W. W. Leontief). In the absence of W. W. Leontief, the one-page letter was read, recommending consideration of some representative of one of the underdeveloped countries for inclusion in our roster of foreign honorary members, and an additional representative from Germany. As possible alternates, the names of two prominent economists from other lands were added. Vitae of the principal candidates were attached. No action was taken. It was suggested that the field of candidates be broadened and that additional names be submitted for consideration at the spring meeting.

6f) *Ad Hoc Committee on the Status of the Profession* (I. L. Sharfman). The carefully prepared report was read (published below), reviewing the work of last year's Committee on Freedom of Teaching, Research, and Publication in Economics (see *Papers and Proceedings*, May, 1954, pages 733-737). This committee had recommended further exploration of the "need and scope of activity" for a standing committee on the status of the profession. In the light of the general situation concerning academic freedom and of the developments of the past year, the present Committee recommended such a standing

committee, with its scope of activity limited, for the time being at least, to the preparation and publication of reports. The Committee also suggested that members of the Association be afforded an opportunity to discuss crucial problems of academic freedom and civil liberties at annual meetings.

After a protracted discussion of the report, it was VOTED to discharge the Committee, with thanks, and the matter was left on the table for further consideration by the Executive Committee at its spring meeting.

6g) *Ad Hoc Committee on Implementation of the Bowen Report* (G. L. Bach). The Committee was not prepared to submit a final report, but G. L. Bach was invited to give an account of the present thinking of its members concerning the principal issues involved. It appeared that little agreement had been reached during preliminary discussions, although all members acknowledged our professional responsibilities with regard to the training of economists and all favored continued study of the recommendations contained in the report. The chairman promised to have a report in the hands of the members of the Executive Committee well in advance of the spring meeting.

6h) *Nominating Committee* (J. D. Black). As a preliminary step in the election process for next year's officers (see bylaws), J. D. Black discussed names of appropriate candidates for the new Nominating Committee. E. G. Nourse was appointed chairman of the 1955 Nominating Committee.

7. *Reports from Council Representatives.*

7a) *ACLS* (F. H. Knight). In view of the rather critical status of this Council with respect to financial support by the foundations, the general question was raised: What are the functions of the national organization devoted to the advancement of human studies at this time and what stake does the AEA have in its survival? F. H. Knight described briefly the origin and history of the Council, its accomplishments, our relations to it, and the circumstances leading up to the present situation. This was the subject of discussion at last year's Council meeting and promises to be the main item on this year's agenda. So far as financial aid was concerned, Frank Knight suggested that direct individual contributing membership would probably prove futile, as well as would solicitations for voluntary contributions from our membership. The matter was left in its present status; namely, to offer to pay our representatives' expenses to ACLS meetings.

Statements of the directors of the ACLS and of the SSRC and other councils, prompted by the Congressional committee investigation of tax-exempt foundations, were alluded to in this connection.

7b) *SSRC* (G. W. Stocking). No oral report was presented at the meeting but one is printed in the "Proceedings."

7c) *NBER* (J. H. Willams). A report is published in these "Proceedings."

8. *Annual Meetings* The time and place of our commitments for subsequent annual meetings were reviewed and confirmed: 1955, New York, New York, Hotel Commodore (joint); 1956, Cleveland, Hotel Cleveland (independent); 1957, Philadelphia, Bellevue-Stratford Hotel (independent); and 1958, Chicago, Palmer House (joint). All meetings are scheduled for December 28-30, except for Chicago, 1958, where dates have been shifted to December 27-29 in order to avoid a conflict with another large organization meeting at the Palmer House December 30-January 1.

The Secretary reported that liaison is maintained with others of the allied social science group at an annually scheduled breakfast conference. He also reported that George Garvy, of the Federal Reserve Bank of New York, had accepted our invitation to serve as chairman of the Committee on Local Arrangements for New York, 1955. A questionnaire slip is being sent to our members along with dues bills in order to poll the sentiment with respect to preferred time, place, and character of meetings after present commitments have run out. The last survey of this kind was conducted in 1945. This mail poll will be processed and results reported at the spring meeting.

9. *Miscellaneous Unfinished Business.* A letter from K. E. Boulding again raised the question of our affiliation with the AAAS. Time did not permit a review of this perennial matter.

A discussion of subjects for new AEA activities was postponed.

The balance of the meeting was devoted to a discussion of program plans for 1955. During J. D. Black's absence (mission to Pakistan), certain members of the Executive Committee agreed to take initial steps in organizing segments of the program.

The meeting was adjourned at 8:00 P.M.

ACTIVITIES AND OPERATIONS

Although no spectacular events marked this year's developments, the year has been one of steady growth and much has been accomplished. Our membership, though increasing at a regressive rate, includes the great bulk of formally trained economists and we maintain our position as the largest and strongest learned or professional society in our field. This position we enjoy by virtue of services rendered to our members in the form of meetings, publications (our own and cosponsored ones), committee activities, and collaboration with other groups at home and abroad—groups having common interests and purposes.

The annual meetings in Detroit were well attended, registration of our own membership totaling 1,175 and a gross paid registration of all associations totaling 1,636. (For statistics of past meetings, see 1953 *Handbook*, page 173.) Accommodations were adequate and the excellent management by a capable local arrangements committee insured smooth operations in all departments. The quality of papers presented maintained the high standards of the past—a judgment which will, we hope, be confirmed by a favorable reception of the May *Papers and Proceedings*. Already plans for the 1955 meeting are beginning to take shape.

The Managing Editor of the *Review* reports a continuous flow of high-quality manuscript and asks authority to enlarge the size of the four big issues of our quarterly publication to permit more space for main articles and for reviews of important foreign books. Except for a twelve-page supplement to the 1953 *Handbook*, no supplementary reports were mailed to our members this year. However, our "consumers" are well treated and get ample money's worth for dues and subscriptions paid. No increase in the present $6.00 charges is contemplated.

Standing Committees on Research and Publications, International Co-operation, Honors and Awards, and Foreign Honorary Members continue to function actively and *Ad Hoc* Committees on Economics in Teacher Education, the Status of the Profession, and the Implementation of the Bowen Report have been investigating the feasibility of our promoting or developing new lines of activity. Only brief references will be made in this report, since the reports of the committees themselves appear below and the minutes of the Executive Committee are reported more fully than usual because of the unavoidable absence of many of its members.

Annual Meetings. Commitments for time and place of future meetings have been made through 1958 (see minutes of December, 1954).

Membership. Exhibit II following this report shows total membership of 7,500 and subscribers of nearly 3,000. The net gain of 200, following a net gain of about the same number as last year, would seem to indicate that we have reached a plateau of growth. We are not satisfied with this record and believe that greater effort could be made to enroll more new members. Many of our younger colleagues as well as older members of the staff have for reasons of inertia or other not performed what should be considered a logical professional function. College and university catalogues, publishers' mailing lists, the National Roster of Scientific and Specialized Personnel, the recent survey of highly

trained personnel, and other sources (see Secretary's Report, May, 1951, page 769, and 1953, pages 566-567, and the "Report on Graduate Education in Economics," pages 22-25) provide evidence to show that there are hundreds, perhaps many hundreds, of logical prospects, many of whom need only to be solicited to induce them to become members. A membership drive might do the business but much can be accomplished, as was indicated in this report last year, by co-operative effort on the part of members. We suggest that you ask for copies of our information booklet and that you distribute to those interested.

Geographical Distribution. The distribution of members and subscribers remains much the same. (See May, 1952, *Papers and Proceedings*, page 720, for brief analysis and reference to previous counts and the 1953 *Handbook*, pages 180-181, for latest published figures.)

Publications. The Association publishes the quarterly *American Economic Review*, the annual *Papers and Proceedings* volume, and occasional supplements, directories and handbooks and an annually revised information booklet.

American Economic Review. The four issues of this year's volume totaled 1,232 pages. Total number of copies printed was 11,000 and the cost of publication $25,436.52. The Managing Editor's Report contains a detailed description of contents (articles, communications, reviews, notes, and the like), costs and the budget for 1955.

We continue a liberal policy in granting permission to quote and reprint materials both from the *Review* and the *Papers and Proceedings*.

The series of photographs and biographical sketches of past presidents has been completed; that is, we have caught up with current incumbents. It is proposed to continue the series until we have included all past editors, secretaries, and treasurers.

The section on "Vacancies and Applications" still serves a useful purpose, after fifteen years of experience.

Papers and Proceedings. The May, 1954, volume contains 765 pages, published at a cost of $13,932.96. We look forward to a slight reduction in the size of the current volume being prepared.

Handbook or Directory. An eleven-page supplement to the 1953 *Handbook* was mailed to our members in July of 1954. It contained names and addresses of new members added to our rolls between April 15, 1953, and June 1, 1954. The next edition will be a volume in the form of a "who's who" *Directory*, such as we published last in 1948, and plans are to issue this in 1955 or 1956.

The sixteen-page information booklet, revised annually, will soon be available for distribution to officers and to prospective members and others interested in learning about the purposes and activities of the Association.

Committee Activities. A roster of members of all standing and *ad hoc* committees is found at the end of this report.

Committee on Research and Publications (S. E. Leland, Acting Chairman). The report published below calls attention to the appearance of William Jaffé's translation of Walras, *Elements d'Economie Politique Pure*. This long-awaited volume is receiving very favorable attention. Volume VII of the "Readings Series," on *Fiscal Policy* (Arthur Smithies and J. K. Butters, editors), is now

completed and should be off the press shortly. The IEA-UNESCO volume on the *University Teaching of Social Sciences: Economics,* which the American Economic Association and the Royal Economic Society helped to underwrite, is now available at a preferred price to members (see note and advertisements in the *American Economic Review*). The volume contains articles on the content of economics curricula and methods of teaching in several foreign countries and should be of interest to all teachers of economics.

In order to clear out excess inventory of Volumes I-V of the "Readings Series," Richard D. Irwin, Inc., last fall announced a sale at reduced prices to members. The results have been gratifying. This is a special opportunity to fill gaps or to start a complete set of this series.

Ad Hoc Committee on Economics in Teacher Education (B. W. Lewis, Chairman). The report of this Committee (see below) raises a number of questions which are of interest to a large number of our members. For instance, should we, as a professional association, co-operate more directly with teachers associations in their efforts to improve the teaching of economics in secondary schools; should we encourage or recognize in some way or offer our facilities to aid in the important work of economic education being done in summer workshops; should we offer our facilities to help organize or give publicity to the numerous educational conferences conducted by business corporations and trade-unions. A 150-page booklet on *Economics in General Education,* which represents proceedings of a conference held at Riverdale, New York, August 22-September 3, 1954, has just been issued by the Joint Council on Economic Education. Some effort may be made to learn who amongst our members are interested in these questions. If enough interest is expressed to warrant the effort and expense involved, we may include an item on this subject in the next *Directory* questionnaire, or we may even prepare a special mailing.

Committee on International Co-operation (Gottfried Haberler, Chairman); *International Economic Association* (H. S. Ellis). H. S. Ellis, in a report published in the "Proceedings," gives an account of the IEA activities and certain changes in the organization that are taking place. Bulletin No. 2, 1954, of the Association Francaise de Science Économique, is almost entirely devoted to the description of the IEA summer conferences held since 1951, to its membership, organization, and publications. We have made previous note of the first three volumes of the *International Economic Papers,* published by Macmillan, London, but available in New York at a special price to members of the AEA. Volume IV is announced for publication in October, 1954, and Volume V is scheduled to appear in 1955.

Ad Hoc Committee on the Status of the Profession (I. L. Sharfman, Chairman). Attention should be called to the carefully prepared report of this Committee. (See minutes and report published below.)

Ad Hoc Committee on Implementation of the Bowen Report (G. L. Bach, Chairman). See minutes.

Reports of Council Representatives. Reports of our representatives to the ACLS, SSRC, and to the NBER (published below) should be of interest to our members.

Committees Appointed During the Year

COMMITTEE ON LOCAL ARRANGEMENTS
Edward L. Cushman, *Chairman*

COMMITTEE ON ELECTIONS
Frank G. Dickinson, *Chairman*
S. Morris Livingston
James Washington Bell, Ex Officio

Ad Hoc COMMITTEE ON IMPLEMENTATION OF BOWEN REPORT
George L. Bach, *Chairman*
Robert D. Calkins
Robert A. Gordon
John K. Galbraith
Albert G. Hart
O. H. Brownlee

Ad Hoc COMMITTEE ON THE STATUS OF THE PROFESSION
I. L. Sharfman, *Chairman*
Ben W. Lewis

NOMINATING COMMITTEE
Morris A. Copeland, *Chairman*
William J. Fellner
Ewan Clague
Martin R. Gainsbrugh
Howard R. Bowen
Mary Jean Bowman

Ad Hoc COMMITTEE ON ECONOMICS IN TEACHER EDUCATION (continued from 1953)
Ben W. Lewis, *Chairman*
Archibald McIsaac
Paul J. Strayer

Standing Committees and Representatives

COMMITTEE ON HONORS AND AWARDS
Norman S. Buchanan, *Chairman* (1956)
George L. Bach (1954)
Edward S. Shaw (1954)
Fritz Machlup (1956)
Edward S. Mason (1958)
Joseph J. Spengler (1958)

COMMITTEE ON FOREIGN HONORARY MEMBERS
Wassily W. Leontief, *Chairman*
P. T. Ellsworth
Paul A. Samuelson

COMMITTEE ON RESEARCH AND PUBLICATIONS
John P. Miller, *Chairman* (1955)
Simeon E. Leland, *Acting Chairman* (1954)
George W. Stocking (1954)
John H. Williams (1955)
Joseph J. Spengler (1954)
Jacob Marschak (1955)
D. Gale Johnson (1956)
Max F. Millikan (1956)
Alexander Gerschenkron (1956)
James Washington Bell

COMMITTEE ON INTERNATIONAL CO-OPERATION
Gottfried Haberler, *Chairman*
Howard S. Ellis
Theodore W. Schultz
James Washington Bell

INTERNATIONAL ECONOMIC ASSOCIATION REPRESENTATIVES
Gottfried Haberler (1955)
Howard S. Ellis (1955)
Milton Friedman (1958)
Max F. Millikan (1958)

SOCIAL SCIENCE RESEARCH COUNCIL REPRESENTATIVES
George W. Stocking (1954)
John P. Miller (1955)
D. Gale Johnson (1956)

AMERICAN COUNCIL OF LEARNED SOCIETIES REPRESENTATIVE
Frank H. Knight (1954)

NATIONAL BUREAU OF ECONOMIC RESEARCH REPRESENTATIVE
John H. Williams (1955)

Representatives of the Association on Various Occasions

WESTERN COLLEGE FOR WOMEN, CENTENNIAL COMMENCEMENT CONVOCATION
Paul J. Garfield
LINCOLN UNIVERSITY (PENNSYLVANIA) CENTENNIAL
Raymond T. Bye
DEDICATION OF AMERICAN BAR CENTER, CHICAGO
Earl J. Hamilton
VEREIN FÜR SOZIALPOLITIK MEETINGS, BAD NAUHEIM
Gottfried Haberler
COLUMBIA UNIVERSITY BICENTENNIAL COMMENCEMENT
Simon Kuznets
INAUGURATION OF UNIVERSITY AND COLLEGE PRESIDENTS:
Edwin Harold Rian, Jamestown College
Lyle J. Tyner
Owen Meredith Wilson, University of Oregon
C. Ward Macy
Carl Cluster Bracy, Mount Union College
Thomas O. Weir
David Hitchens Morgan, Texas A. and M. College
T. R. Hamilton
Herrick Black Young, Western College for Women
Joseph C. Seibert
William James Lord Wallace, West Virginia State College
Andrew J. Dadisman
Clifford Cook Furnas, University of Buffalo
Ralph C. Epstein

Use of Mailing List

The following were granted permission to use our mailing list to send the material indicated:

UNIVERSITY OF CHICAGO PRESS: To send promotional material on six books.

COMMITTEE FOR ECONOMIC DEVELOPMENT: To send prepublication notice of papers on problems in antirecession policy, and policy statements on "Managing the Federal Debt" and "United States Tariff Policy."

UNIVERSITY OF MICHIGAN, BUREAU OF BUSINESS RESEARCH: To advertise Business Studies, Business Reports, and Business Papers series.

NATIONAL ASSOCIATION OF MANUFACTURERS: To send *Educational Aids for Colleges, Instructor's Manual for Productivity,* and research study, *Productivity—Gauge of Economic Performance.*

The Business Outlook: To send trial subscription offer.

S. Millman: To send out circular on new books in economics and some specially priced books.

THE ANTIOCH PRESS: To send material regarding the book, *Wildcat Strike,* by Alvin W. Gouldner.

INSTITUTE OF LIFE INSURANCE: To send 1953 *Life Insurance Fact Book.*

COMMERCIAL CREDIT CORPORATION: To send Clyde W. Phelps's monograph, *Financing the Instalment Purchases of the American Family.*

AMERICAN ACCOUNTING ASSOCIATION: To send invitations to members to subscribe to *The Accounting Review.*

RUTGERS UNIVERSITY PRESS: To send circular on Professor Kurihara's *Post-Keynesian Economics.*

BOYCE MORGAN & ASSOCIATES: To offer 1965 business outlook study and introductory subscription to the *Report on the Business Outlook.*

KELLEY & MILLMAN: To send out notice of a book sale.

AMERICAN INSTITUTE FOR ECONOMIC RESEARCH: To send two technical bulletins and fellowship award announcements and application blanks and announcement of *Reconstruction of Economics,* by E. C. Harwood.

Respectfully submitted,

JAMES WASHINGTON BELL, *Secretary*

EXHIBIT I

PUBLICATION COSTS

Papers and Proceedings				Handbooks		
Year*	Number of Pages	Number of Copies	Cost	Number of Pages	Number of Copies	Cost
1930	222	4,300	$ 1,353.91			
1931	308	4,300	1,919.18	88	4,200	$ 589.54
1932	316	4,200	1,819.75			
1933	216	4,000	1,284.85	88	3,900	522.71
1934	232	3,700	1,192.91			
1935	248	4,000	1,347.88			
1936	360	4,200	2,037.90	58	4,100	454.36
1937	344	4,300	1,922.03			
1938	200	4,500	1,234.10	112	4,500	1,118.84†
1939	288	4,600	1,785.91			
1940	444	4,900	2,658.12	108	5,000	822.58
1941	479	5,200	3,294.45			
1942	548	5,400	3,909.79	208	5,500	1,775.72†
1943	535	5,500	3,652.56			
1944	470	5,800	3,350.40			
	144	5,900	1,215.22‡			
1945	536	6,400	4,502.84			
1946	960	6,700	8,149.90	143	6,900	2,035.71
1947	781	7,700	8,140.79			
1948	591	8,500	8,701.41	345	7,700	6,948.06†
1949	537	9,500	7,844.50			
1950	650	10,100	9,864.76	41	9,200	1,163.84†
1951	816	10,400	11,965.40	18	8,300	692.63†
1952	768	10,700	13,190.83	11	8,188	620.09†
1953	612	10,900	10,935.98	187	8,400	4,416.69
1954	765	11,000	13,933.00	11	7,900	660.06

* This is the year of publication and pertains to the meeting of the preceding year. The figures are published in the subsequent year.

† "Who's who" volumes; 1950—"Who's who" supplement; 1951, 1952, and 1954—names and addresses supplement.

‡ Part of papers presented at annual meeting published as supplement to June number.

EXHIBIT II

MEMBERS AND SUBSCRIBERS

Class of Membership	Totals 11/30/53	Added	Removed	Gain or *Loss*	Totals 11/30/54
Annual	6,682	620*	436§	184	6,866
Junior	409	296†	342*	*46*	363
Family	121	14	12	2	123
Complimentary	40	10	4	6	46‡
Life	62	7	—	7	69
Honorary	21	1	3	*2*	19
	7,335	948	797	151	7,486
Subscribers	2,844	512	438	74	2,918
Complimentary	30	5	28	*23*	7
Totals	10,209	1,465	1,263	202	10,411

* Includes 137 junior members changed to annual.

† Includes 20 annual members changed to junior.

‡ Includes 10 who do not receive publications.

§ Resigned, 82; nonpayments, 260; died, 22; lack of address, 52, changed to junior members, 20.

REPORT OF THE TREASURER FOR THE YEAR ENDING NOVEMBER 30, 1954

The financial results for the past year are shown in the following comparative statements. The first shows financial operations and the second balance-sheet conditions for the current year compared with last year and five years ago. These tables supplement the detailed report of the Auditor, which immediately follows the Report of the Finance Committee.

Financial Operations. In the table below, showing income and expenses, we group all sources of income together as well as all items of expenditure. In the Auditor's Report, operation and publication results are separated.

Comparative Results of Operations for 1949, 1953, and 1954

	11/30/49	11/30/53	11/30/54
Income			
Membership dues	$31,121	$ 41,970	$ 42,991
Subscriptions	12,254	16,491	16,838
Sales	1,863	2,524	2,440
Advertising	7,775	8,019	7,543
Directory income	1,410	—	—
Republications income	1,000	—	—
Sundry income	—	63	845
Dues and publications income	$55,423	$ 69,067	$ 70,657
Interest	$ 1,117	$ 1,435	$ 1,621
Dividends	3,170	3,588	2,962
Less custodian fees	*126*	*179*	*176*
Sales of securities (net)	48	11,636	10,727
Investments (less fees)	$ 4,209	$ 16,480	$ 15,134
Total income	$59,632	$ 85,547	$ 85,791
Expenses			
Office salaries	$11,637	$ 15,251	$ 15,491
Other administrative expenses	3,275	3,630	4 479
Annual meeting	*470*	130	*1,765*
Executive Committee	1,700	1,939	1,268
Other committee expenses	864	1,039	342
Administative and operating expenses	$17,006	$ 21,989	$ 19,814
Review printing	$20,165	$ 24,292	$ 25,031
Papers and Proceedings printing	7,845	10,936	13,933
Handbook printing	—	4,018	1,059
Editorial office (*Review*):			
Contributors	1,667	1,562	3,015
Editorial and clerical salaries	7,243	9,843	9,953
Other expenses (net)	756	78	78
Publications	$37,676	$ 50,729	$ 53,069
Total expenses	$54,682	$ 72,718	$ 72,883
Net operating income or *loss*	$ 4,950	$ 12,829	$ 12,908
Appropriations	—	—	985
Net income or deficit	$ 4,950	$ 12,829	$ 11,923

Total income from all sources amounted to $85,791 for the fiscal year 1954, which was approximately the same as for the previous year. No significant changes are noted in the two-year comparisons. By coincidence, even profits on security sales were approximately the same. Growth factors account for present magnitude when compared with five years ago, but show some flattening out, at least so far as income is concerned. However, expenses show no marked shifts except for the unusual profit figure for the 1953 annual meeting and the increases in office and printing costs. Our net income this year was again especially large. Like last year, some non-recurring income accounted for this, as well as the lack of any extraordinary expenditures.

Financial Condition. The balance-sheet figures below show comparative status of the principal assets, liabilities, appropriated and other funds, and surplus account for the current year, last year, and five years ago. The especially liquid condition is accounted for by the investment shifts referred to in the Finance Committee report. Under liabilities, "Accounts payable" represents a more normal figure than the one for the previous year, which included estimates not only for the December number of the *Review* but also the *Handbook*. Appropriations exist at this time only for the Committee on Research and Publications.

COMPARATIVE FINANCIAL CONDITION FOR 1949, 1953, AND 1954

	11/30/49	11/30/53	11/30/54
Assets			
Cash on deposit and on hand	$ 7,456	$ 4,568	$ 12,041
Receivables (net)	3,422	3,671	21,479
Prepaid expenses and inventories	779	969	644
Furniture and fixtures (net)	675	1,817	1,639
Investments at cost:			
Bonds	33,109	68,308	61,519
Stocks	48,427	46,459	38,082
Total assets	$93,868	$125,792	$135,404
Liabilities and Funds			
Accounts payable	$ 6,080	$ 10,590	$ 7,467
Allied Social Science Associations	829	—	—
Deferred income	16,366	8,062	8,597
Membership extension fund	1,088	609	491
Fund for proposed secretariat	35	—	—
Sundry	—	—	10
Fund for Committee on Research and Publications	—	315	944
Fund for Committee on Public Issues	—	945	—
Committee appropriations (not expended)	1,877	—	—
Life memberships	4,325	7,025	7,725
Total liabilities and funds	$30,600	$ 27,546	$ 25,234
Surplus			
Balance at beginning of period	$58,219	$ 85,417	$ 98,246
Transfers from life memberships	100	—	—
Net income or *loss* for period	4,950	12,829	11,924
Unappropriated surplus	$63,269	$ 98,246	$110,170
Total footings	$93,869	$125,792	$135,404

Net worth or surplus after deducting liabilities and appropriations from total resources amounts to $98,246, which with the net income for the year of $11,924 gives us an unappropriated surplus of $110,170. This is, in a sense, the measure of our rainy-day fund, our insurance against adverse times, our resources for new undertakings and for our continued growth. With this backlog we can continue with assurance with our present modest $6.00 per annum dues and subscriptions while our contemporaries for the most part find it necessary to raise their dues.

The accompanying table shows changes in our investment portfolio for selected dates as well as the rate of return on these investments.

Respectfully submitted,

JAMES WASHINGTON BELL, *Treasurer*

INVESTMENT PORTFOLIO

Year	At Par	Cost			Market
	Bonds	Bonds	Stocks	Total	Stocks and Bonds
1925	$25,000	$24,661.75		$ 24,661.75	
1930	31,000	32,439.48		32,439.48	
1933	33,500	32,962.48	3,954.23	36,916.71	$ 31,522.50
1935	16,000	15,280.48	28,114 50	43,394.98	50,338.72
1940	25,000	22,519.80	41,155 95	63,675.75	60,553.88
1942	27,000	24,651.12	41,556.06	66,207.18	58,211.88
1945	40,000	36,705.95	44,955.81	81,661.76	103,574.76
1948	35,000	33,108.63	48,624.14	81,732.77	84,841.91
1950	35,000	33,108.63	51,978.53	85,087.16	104,177.27
1951	43,000	43,340.16	49,764.51	93,104.67	117,316.75
1952	42,000	42,312.67	58,934.00	101,246.67	130,836.02
1953	68,000	68,308.05	46,458.90	114,766.95	134,562.38
1954	61,000	61,518.63	38,082.20	99,600.83	132,280.63

RETURN ON INVESTMENTS

Year	Bonds	Stocks	Total	Rate of Return on Cost
1925	$1,350.00		$1,350.00*	
1930	1,695.21		1,695.21	5.22%
1933	1,679.49	$ 108.57	1,788.06	4.84
1935	1,022.96	680.70	1,703.66	3.92
1940	1,037.56	2,182.46	3,220.02	5.06
1942	1,306.49	2,186.17	3,492.66	5.28
1945	1,479.99	2,488.85	3,968.84	4.71
1948	1,194.85	2,944.31	4,139.16	5.06
1950	1,117.50	3,860.39	4,977.89	5.85
1951	1,026.30	4,607.67	5,633.97	6.05
1952	1,117.84	3,681.53	4,799.37	4.75
1953	1,435.12	3,587.45	5,022.59	4.36
1954	1,621.06	2,961.75	4,582.81	4.58

* Estimated income for year.

REPORT OF THE FINANCE COMMITTEE

December 23, 1954

Executive Committee,
American Economic Association,
Evanston, Illinois.

GENTLEMEN:

The following report of the investment holdings of the Association is for the fiscal year ending November 30, 1954. The exhibit shows the list of securities held by the Association at cost and at approximate market value at fiscal year-end. Changes made during the year are indicated and profit or loss on sales is shown.

During the past year, the following changes were made:

SUMMARY OF SECURITIES SOLD OR MATURED
Year Ended November 30, 1954

Shares or Par Value	Issue	Cost	Selling Price	Gain or *Loss*
	Sold			
50	Aluminum Corp. of America	$ 2,133.07	$ 3,591.73	$ 1,458.66
105	Olin Mathieson Chemical Corp.	4,713.73	5,838.70	1,124.97
50	Monsanto Chemical Co	3,120.74	4,598.68	1,477.94
100	Pillsbury Mills, Inc. ..	3,653.78	4,755.40	1,101.62
75	Procter & Gamble Co..	2,459.72	7,030.05	4,570.33
16/100	Gulf Oil Corp....	—	7.40	7.40
$ 3,000	U.S. Savings Series G, 2½%, 2/1/54	3,000.00	3,000.00	—
4,000	Illinois Central R R. Co., 4¾%, 8/1/66	4,026 17	4,100 00	73 83
15,000	U.S. Treasury Notes, 2⅛%, 12/1/53	15,000 00	15,000.00	—
5,000	U.S. Treasury C. of I., 2¼%, 2/15/54	5,000.00	5,000 00	—
14,000	U.S. Treasury Bonds, 3¼%, 6/15/83	13,991.25	14,918.75	927.50
12,000	U.S. Treasury C. of I., 2⅝%, 6/1/54	12,015 00	12,000.00	*15.00*
	Total	$69,113 46	$79,840.71	$10,727 25

Shares or Par Value	Issue	Cost
	Bought	
50	Carrier Corp.......... . . .	$ 2,990.61
100	Olin Mathieson Chemical Corp .	4,713.73
$ 6,000	Gulf Interstate Gas Co., 6%, 12/1/54.......	6,240.00
20,000	U.S. Treasury Notes, 1⅞%, 2/15/59	20,003.00
5,000	U.S. Treasury Bonds, 2½%, 11/15/61............	5,000.00
15,000	U.S. Treasury Bonds, 2½%, 12/15/58	15,000.00
	Total	$53,947.34

Although but two formal meetings of the Finance Committee were held during the year, we had several informal conferences and were always within reach of each other by telephone. In May and November, we met to consider formal appraisals of our holdings and discussed investment policy at length. In general, our object was to maintain a fairly defensive position during a period of "doubtful recession" but in which stock prices were rising continuously. We started the year with the bond-to-stock ratio roughly 60:40 on cost and 50:50 on market value. Both in the spring and in the fall, we took profits on stock sales, investing the proceeds of these sales and those of maturing bonds in U.S. securities. By year-end, the 60:40 ratio of bonds to stocks was re-established on a cost basis, though the approximate market value on November 30, 1954, showed stocks worth $70,000-odd to bonds $60,000-odd.

LIST OF SECURITIES HELD BY THE ASSOCIATION

Stocks

Number of Shares of Common Stock	Issue	Cost	Approximate Market Value 11/30/54
50	Aluminum Co. of America	$ 2,133.08	$ 4,100.00
50	Carrier Corp.	2,990.61	2,825.00
200	Central and South West Corp.	2,801.69	6,075.00
100	Continental Can Co.	3,714.55	7,775.00
100	Eastern Air Lines	2,774.10	3,362.50
134	Gulf Oil Corp.	3,716.99	8,207.50
220	Household Finance Corp.	4,222.32	6,930.00
300	Houston Lighting & Power Co.	3,088.53	12,150.00
100	Kroger Co.	1,851.74	4,775.00
60	Peoples Gas Light & Coke Co.	7,466.15	9,300.00
110	Socony Vacuum Oil Co.	3,322.44	5,266.25
		$38,082.20	$ 70,766.25

Bonds

Par Amount	Issue	Cost	Approximate Market Value 11/30/54
$ 6,000	Gulf Interstate Gas Co., 6%, Interim Notes, due 12/1/54	$ 6,240.00	$ 6,300.00
20,000	U.S. Treasury Notes, 1⅞%, Series "A-1959," due 2/15/59	20,003.00	19,931.25
5,000	U.S. Treasury Bonds, 2½%, due 11/15/61	5,000.00	5,042.19
8,000	U.S. Treasury Bonds, 2¾%, Series "B," due 1975/80	8,000.00	7,985.00
7,000	U.S. Treasury Bonds, 2½%, due 12/15/72–67	7,275.63	6,927.81
15,000	U.S. Treasury Bonds, 2½%, due 12/15/58	15,000.00	15,328.13
	Bonds	$61,518.63	$ 61,514.38
	Stocks	38,082.20	70,766.25
	Total	$99,600.83	$132,280.63

The above table shows that securities costing $69,113 were sold at $79,840, making a profit of $10,727. From the proceeds of about $80,000, we invested approximately $54,000, representing some shifts in stocks but mostly in government securities. The $20,000 shown as receivables on November 30 were invested a few days later in government securities, which means in final analysis that some $6,000 were taken out of the fund.

The exhibit accompanying the Treasurer's Report shows our investment holdings and the rate of return on cost over a period of years. The rate of return for the past year averaged nearly 5 per cent.

Respectfully submitted,

ROY C. OSGOOD, *Chairman*
C. WELLS FARNHAM
JAMES WASHINGTON BELL

REPORT OF THE AUDITOR

December 20, 1954

Executive Committee
American Economic Association
Evanston, Illinois

DEAR SIRS:

In accordance with instructions we have examined the accounts and related records of the American Economic Association for the year ended November 30, 1954, and now submit our report thereon together with the following exhibits:

Statement of Financial Position—November 30, 1954	Exhibit 1
Statement of Income and Expense for Year Ended November 30, 1954	Exhibit 2

Results from Operations

Net income for the year ended November 30, 1954, was $11,924 compared with net income of $12,829 for the year ended November 30, 1953, as shown in the following summary:

Particulars	Year Ended November 30 1953	Year Ended November 30 1954	Increase *Decrease*
Income:			
Dues	$41,970	$42,992	$1,022
Interest and dividends (net)	4,844	4,406	*438*
Profit on sales of securities (net)	11,636	10,727	*909*
Miscellaneous income	63	845	782
Total income	$58,513	$58,970	$ 457
Expense:			
Publication expense	$50,729	$53,068	$2,339
Less—Publication income	27,034	26,821	*213*
Net publication expense	$23,695	$26,247	$2,552
Administrative and other operating expenses	21,989	19,814	*2,175*
Total expense	$45,684	$46,061	$ 377
	$12,829	$12,909	$ 80
Less—Appropriation	—	985	985
Net Income	$12,829	$11,924	$ *905*

The increase in dues reflects the increase in membership during the year under review, as reported by the Secretary:

Classification	Number of Members at November 30 1953	1954
Regular	6,682	6,866
Junior	409	363
Family	121	123
Life	62	69
Honorary	21	19
Complimentary	40	46
Total	7,335	7,486

Interest on bonds owned was accounted for in accordance with stated rates; dividends received on stocks were compared with amounts reported in published records of dividends paid.

Net publication expense, as shown in the following summary, amounted to $26,247 for the current year compared with $23,695 for the preceding year:

Particulars	Year Ended November 30 1953	1954	Budgetary Estimates for Year 1954
Expenses:			
Printing of—			
Review	$24,292	$25,031	$24,700
Handbook	4,018	1,059	
Proceedings	10,936	13,933	
Editor's honorarium	3,500	3,500	3,500
Payments to contributors	1,562	3,015	2,500
Editorial clerical salaries	6,343	6,452	6,550
Editorial supplies and expenses	493	713	600
Sundry publication expenses	415	635	
Total expenses	$50,729	$53,068	
Less—Income:			
Subscriptions, other than members	$16,491	$16,838	
Sales of copies	2,524	2,440	
Advertising	8,019	7,543	
Total income	$27,034	$26,821	
Net publication expense	$23,695	$26,247	

There was an increase of $2,552 in net publication expense (from $23,695 to $26,247) consisting of the following:

Increase in subscriptions	$ 347
Decrease in copy sales	84
Decrease in advertising	476
Increase in expenses (net)	2,339
Net increase	$2,552

Billings for the December, 1954, issue of the *Review* and reprints had not been made by the publishers at the time of our examination. The publishers estimated the *Review* printing to cost $6,550 and the reprints $105 which amounts are included in the foregoing tabulation.

Financial Position

Condensed statements of financial position of the Association at November 30, 1953, and 1954 are compared below:

Assets	November 30 1953	1954	Increase *Decrease*
Cash on deposit and on hand	$ 4,568	$ 12,041	$ 7,473
Receivables (net)	3,671	21,479	17,808
Prepaid expenses	969	644	*325*
Furniture and fixtures (net)	1,817	1,640	*177*
Investments at cost—			
Bonds	68,308	61,519	*6,789*
Stocks	46,459	38,082	*8,377*
	$125,792	$135,405	$ 9,613
Liabilities, Funds and Surplus			
Accounts payable	$ 10,590	$ 7,467	$ *3,123*
Deferred income	8,062	8,597	535
Sundry fund		10	10
Membership extension fund	609	491	*118*
Fund for Committee on Research and Publications	315	945	630
Committee on Public Issues	945		*945*
Life memberships	7,025	7,725	700
Surplus—			
Balance at beginning of year	85,417	98,246	12,829
Net income for year	12,829	11,924	*905*
	$125,792	$135,405	$ 9,613

Cash on deposit was satisfactorily reconciled with balances confirmed directly to us by the depositories.

The receivables of the Association were not confirmed by correspondence with debtors. Based upon the Association's past experience the reserve for doubtful accounts appears to be adequate to cover normal losses.

Changes in the investment account were verified by the examination of brokers invoices and other supporting data. Securities held at November 30, 1954, were confirmed directly to us by the State Bank and Trust Company of Evanston, Illinois, custodian for the Association.

Insofar as we were able to ascertain, all liabilities of the Association at November 30, 1954, are reflected in the accompanying statement of financial position and the Secretary has represented to us that to the best of his knowledge all liabilities are disclosed.

A summary of the transactions in the various funds is presented hereunder:

Particulars	Membership Extension Fund	Sundry Fund	Public Issues	Committee on Research and Publications
Balance November 30, 1953	$608.96	$	$944 91	$314.56
Changes during year—				
Appropriations				985.44
Received		37.76		
Expended	*118.20*	*28.06*	*160.25*	*355.26*
Transferred to miscellaneous income			*784.66*	
Balance November 30, 1954	$490.76	$ 9.70	$	$944.74

We were advised that the Committee on Public Issues was discontinued. The unexpended balance was transferred to miscellaneous income.

We express our appreciation of the courtesies and cooperation extended to our representatives during the course of the examination.

Very truly yours,

DAVID HIMMELBLAU & CO.
Certified Public Accountants

EXHIBIT 1

American Economic Association
Statement of Financial Position—November 30, 1954

Assets

Current Assets:			
Cash on deposit and on hand—			
State Bank and Trust Company, Evanston	$ 3,909.78		
National Bank of Commerce of Chicago	8,106.07		
Petty cash	25.00	$ 12,040.85	
Receivables—			
Review advertising	$ 2,237.85		
Accrued interest and dividends	743.08		
Publication sales	330.98		
Membership dues	653.50		
Due on securities sold	17,624.15		
Sundry	247.05		
Total receivables	$21,836.61		
Less—Reserve for doubtful accounts	357.55	21,479.06	
Inventory of stamps and envelopes		574.28	
Unexpired insurance		69.60	
Total current assets		$ 34,163.79	
Investments (at cost):			
Bonds	$61,518.63		
Stocks	38,082.20	99,600.83	
Furniture and Fixtures (less accumulated depreciation)		1,639.54	
Total assets		$135,404.16	

Liabilities, Funds and Surplus

Current Liabilities:			
Accounts payable			$ 7,466.98
Deferred Income:			
Prepaid subscriptions		$ 7,317.38	
Prepaid dues		1,279.24	8,596.62
Funds:			
Membership Extension		$ 490.76	
Committee on Research and Publications		944.74	
Sundry		9.70	1,445.20
Life Memberships and Surplus			
Life memberships		$ 7,725.00	
Unappropriated surplus—			
Balance November 30, 1953	$98,246.53		
Net income for year ended November 30, 1954 (Exhibit 2)	11,923.83	110,170.36	117,895.36
Total liabilities, funds and surplus			$135,404.16

AUDITOR'S OPINION

Executive Committee
American Economic Association.

In our opinion, the accompanying financial statements present fairly the financial position of American Economic Association at November 30, 1954 and the results of its operations for the year ended that date, in conformity with generally accepted accounting principles applied on a basis consistent with that of the preceding year.

Our examination was made in accordance with generally accepted auditing standards and included such tests of the accounting records and other auditing procedures as we considered necessary in the circumstances.

Chicago, Illinois
December 20, 1954

David Himmelblau & Co.
Certified Public Accountants

EXHIBIT 2

American Economic Association
Statement of Income and Expense
for the Year Ended November 30, 1954

Particulars			Amount	
Income:				
Dues—				
Regular, junior and family members			$41,812.36	
Subscribing and contributing members			1,179.00	$42,991.36
Investments—				
Interest on bonds		$ 1,621.06		
Dividends		2,961.75		
		$ 4,582.81		
Less—Custodian fees		176.34	$ 4,406.47	
Gain on sale of securities (net)			10,727.25	15,133 72
Miscellaneous income (net)				845.26
Total income				$58,970.34
Expense:				
Administrative and other operating expenses—				
Secretary's salary		$ 3,500 10		
Office salaries		11,990.87		
Annual meeting (net)		1,766.24		
Executive committee expenses		1,267.87		
Other committee expenses		342.02		
Postage expense		889.26		
Stationery and supplies		1,532.33		
Insurance		183 11		
Provision for depreciation		187.25		
Telephone and telegraph		106 57		
Dues and expenses—				
American Council of Learned Societies		100.00		
International Economic Association		400 00		
Exchange on checks		52.05		
Social security taxes		288.22		
Miscellaneous expense (net)		739.88	$19,813.29	
Publication expenses—				
Printing of:				
Review		$25,031.03		
Handbook		1,058.75		
Proceedings		13,932.96		
Editors honorarium		3,500.00		
Payments to contributors		3,015.00		
Editorial clerical salaries		6,452.55		
Editorial supplies and expense		712.93		
Sundry publishing expenses		634.64		
Total publishing expense		$53,068 58		
Less—Publication income:				
Subscriptions, other than members	$16,838 32			
Sales of copies	2,439.61			
Advertising	7,542.87	26,820.80	26,247.78	
Total expense				46,061.07
Balance				$12,909.27
Less—Appropriation for Research and Publications				984 44
Net Income for Year Ended November 30, 1954 (Exhibit 1)				$11,923.83

REPORT OF THE MANAGING EDITOR FOR THE YEAR ENDING DECEMBER, 1954

The editor of a professional journal is seldom content. Either the flow of good manuscripts is not as heavy as he would like or it is more than adequate, with the result that he is unable to find room for all of the papers worthy of publication. It is the latter situation that has confronted the Editorial Board of the *Review* this past year. Although the total number of manuscripts submitted has not increased as compared with 1953, the number of articles as distinct from communications has risen from 122 to 160. Furthermore, it is the general impression of members of the Editorial Board that the quality of the papers offered for publication has been noticeably better than in recent years. At the same time, the percentage of articles accepted has of necessity dropped to a very low 12.5 per cent, even though the space allocated to them was increased substantially. Many of the articles that could not be accepted have, however, found other publication outlets. Table 1 gives comparative figures with regard to manuscripts submitted for the past six years.

TABLE 1

MANUSCRIPTS SUBMITTED, 1949–54

	1954	1953	1952	1951	1950	1949
Manuscripts received	231	234	190	222	197	200
Articles	160	122	133	157	156	144
Communications	71	112	57	65	41	56
Percentage of articles accepted	12.5	15	21	19	19	20

As the table also reveals, the number of communications submitted this past year was much lower than in 1953. This, however, is not surprising, as the 1953 year was abnormally high, owing to the fact that there were included in the 1952 volume seven articles that turned out to be highly controversial. The flow of communications returned to something like a normal level this past year.

Table 2 provides a summary of the break-down of the volume as between articles, communications, book reviews, etc. Since the proportion of the volume devoted to articles was increased in response to the increase in the number of acceptable manuscripts submitted, space devoted to communications correspondingly contracted; and there was some reduction in the space devoted to book reviews (without, however, a corresponding reduction in the number of books reviewed). The other departments of the *Review* changed comparatively little.

We have continued the policy of slightly favoring articles that have some empirical basis. Of the thirty leading articles in the 1954 volume, I believe it

TABLE 2

SUMMARY OF CONTENTS, 1952–54

	1954		1953		1952	
	No.	Pages	No.	Pages	No.	Pages
Leading articles	30	481	18	389	28	428
Communications:						
Original	6	37	5	20	11	52
Comments and replies	11	42	28	112	8	25
Book reviews	159	301	161	339	173	349
Memorials	1	2	1	2	—	—
Classified list of new books		57		59		59
Classified list of periodical articles		53		54		44
Classified list of dissertations		27		32		46
Notes		38		34		34
		1042*		1044*		1037

* Includes blank pages.

would be fair to say that fourteen were based on empirical, or at least factual, research, while thirteen were essentially theoretical, and three review articles. With regard to subject-matter fields, there was the usual concentration in general economic theory—seven articles and three communications. This past year, however, there was also an unusually heavy concentration in the international field—eight articles and two communications. The remaining papers were rather widely distributed. Table 3 summarizes the subject-matter distribution for the thirty articles and seventeen communications.

TABLE 3

SUBJECT-MATTER DISTRIBUTION: ARTICLES AND COMMUNICATIONS, 1954

	Articles	Original Communications	Comments and Replies
General economic theory	7	1	2
Planning	1	—	—
Social accounting	2	—	—
Business fluctuations	1	1	3
Money and banking	1	—	—
Public finance	3	—	2
International economics	8	2	—
Industrial organization	1	1	
Land economics	2	—	—
Labor	2	1	2
Population; social welfare	2	—	2
	30	6	11

The problem of book reviews continues to be troublesome. As in the past few years, many books that should have been given at least a short review notice have had to be passed over. I am told time and again by members of the Association that they find the book review section particularly useful, and that they would like to see more nearly complete coverage of the new books. Yet I do not believe that this should be done at the expense of the space devoted to

articles and communications; and the other departments have been reduced to about their minimum length if they are still to be useful. I have tried out this past year on a very limited scale the device of short summary notes prepared by graduate students in the case of less important books; but I am not satisfied that the solution lies in this direction. I have also reduced the average length of the book reviews accepted, by insisting on quite short reviews in some cases.

Another difficulty with the book review section has been the rather limited extent to which reviews of foreign books have been included. This is partly due to lack of space, but to a greater extent to the difficulty of learning about the books published abroad that are worthy of review. In order to begin to meet this problem, I have been authorized by the Executive Committee of the Association to appoint a number of foreign correspondents who will advise me from time to time about important books published in their respective countries, and who will, I hope, serve the *Review* in other ways as well. Thus far the following correspondents have been appointed, and have been assisting me this past year:

Alexandre Kafka (Brazil) — Victor L. Urquidi (Mexico)
Jean-Marcel Jeanneney (France) — P. J. Verdoorn (Netherlands)
Erich Schneider (Germany) — Erik Lindahl (Sweden)
Giovanni Demaria (Italy)

The increase in the number of reviews of foreign books that may be expected to result from this program will of course put further pressure on the available space for reviews; but some reallocation of space in favor of the work of the economists of other lands is surely desirable. It may, however, also be desirable to consider whether the Association can afford to increase the size of the *Review* about thirty pages per volume—the additional space to be devoted to reviews of foreign books.

Table 4 presents the actual expenditures in 1954 in comparison with the estimated budget and with actual expenditures in 1953. Partly because of the increase from 10,900 to 11,000 in the number of copies printed, our costs for printing and mailing are about $700 higher than the budgeted amount, and about $1,000 higher than last year. The other items are quite close to their budgeted amounts for the year. Because of the larger number of articles published, the payments to contributors were substantially higher in 1954 than in

TABLE 4

ACTUAL AND BUDGETED EXPENDITURES

	Budget 1954	Actual 1954	Actual 1953
Printing and mailing	$24,700	$25,436.52*	$24,365.57†
Editorial	3,500	3,500.00	3,500.00
Editorial assistance	6,550	6,602.76	6,366.88
Supplies	600	611.37	515.13
Contributors	2,500	2,488.50	2,059.00
	$37,850	$38,639.15	$36,806.58

* Printing estimate December number: $6,550 plus reprints $65.00.
† Corrected from 1953 Annual Report.

TABLE 5

COPIES PRINTED, SIZE AND COST OF PRINTING

	Copies Printed	Pages Net	Pages Gross	Cost Including Reprints
March	11,000	250	296	$ 6,243.10
June	11,000	260	296	6,008.93
September	11,000	280	320	6,569.49
December	11,000	252	320	6,615.00 (estimated)
		1,042	1,232	$25,436.52

1953, although not in excess of the budgeted amount. Table 5 shows the number of copies, size and cost of printing by quarters.

The estimated costs for the coming year are presented in Table 6, based on a volume of 1,000 pages and a printing of 11,000 copies.

TABLE 6

RECOMMENDED BUDGET FOR 1955

Printing (paper, postage, reprints, etc.)	$25,500
Editor's salary	3,500
Editorial assistance	6,600
Supplies	600
Contributors	2,500
	$38,700

During the year I have frequently sought the aid of members of the profession in addition to the hard-working members of the Editorial Board—partly to relieve the latter of some of the excessively heavy burden they have been carrying and partly to obtain advice of specialists in particular areas not represented on the Editorial Board. The following have assisted us in this way:

M. A. Adelman
A. A. Alchian
K. Arrow
G. L. Bach
A. Bergson
K. E. Boulding
K. Brunner
N. W. Chamberlain
L. V. Chandler
J. B. Condliffe
J. S. Davis
E. Domar
R. Dorfman
J. F. Due
R. Eisner
W. Fellner
M. Friedman
A. Gerschenkron
J. K. Galbraith
A. G. Gruchy
G. N. Halm
R. W. Harbeson
A. G. Hart
E. P. Hohman
E. M. Hoover
H. S. Houthakker
D. G. Johnson
W. O. Jones
N. Kaplan
F. Machlup
S. J. Maisel
R. Musgrave
W. H. Nicholls
R. V. Roosa
P. A. Samuelson
T. W. Schultz
T. Scitovsky
L. H. Seltzer
E. S. Shaw
J. J. Spengler
W. F. Stolper
B. Swerling
W. B. Taylor
G. Tintner
J. Tobin
H. F. Williamson

Respectfully submitted,

BERNARD F. HALEY, *Managing Editor*

REPORT OF THE COMMITTEE ON RESEARCH AND PUBLICATIONS

The Committee on Research and Publications presents herewith a report of progress and achievements for the current year:

1. The translation of Walras, *Elements d'Economie Politique Pure,* by William Jaffé, sponsored by the American Economic Association and the Royal Economic Society, has appeared in published form. The volume has been well received. Sales are going well. A number of reviews also appeared; more are scheduled for publication.

2. The preliminary draft of *Readings on Fiscal Policy,* under the editorship of Arthur Smithies and J. K. Butters, has been prepared and the final draft of the manuscript is being completed. The volume should appear in 1955.

3. An article on "Bibliographies in Economics" for publication in the *Review* is in preparation by Donald Irwin. This project was approved by the Executive Committee, April 2, 1954. It will be useful not only to economists but also to reference librarians.

4. The preparation of a volume of readings on industrial organization was put on the agenda for the next meeting of the Committee on Research and Publications. George Stocking agreed to present a preliminary report on the articles available and to suggest a possible list of readings for publication. The feasibility of this project can then be determined.

5. Consideration was also given to the possibility of publishing a book of readings on economic growth. Max Millikan agreed to prepare a list of possible items for such a volume for the next meeting of the Committee. On the basis of this report the scope and emphasis of the volume could be determined. It was suggested that some of the readings be devoted to the problems of underdeveloped countries. Historical materials were also to be given weight.

The Committee on Research and Publications also considered various proposals for the translation of foreign works, but no action was taken. The Committee continued to believe that translations of the works of Pareto should have highest priority at this time. Gale Johnson agreed to present a report on the status of Pareto translations at the next meeting of the Committee.

The major business before the Committee was the proposal to prepare a cumulative index of the *American Economic Review* and the *Papers and Proceedings* of the American Economic Association. The details of a basic plan for the index and cost estimates therefore were presented by Bernard Haley, who had constructed a sample index based upon four regular numbers of the *Review* (December, 1953, to September, 1954) and the May, 1954, *Papers and Proceedings*. After considerable discussion it was decided to recommend to the Executive Committee that it authorize the compilation and publication of a cumulative classified index of the *American Economic Review* and the *Papers and Proceedings* of the American Economic Association for the period since 1911, the indexing plan to be roughly as follows: (1) index to cover Volume I to XLIV (or XLV depending upon date of completion of the index) of the

Review and *Papers and Proceedings;* (2) the index to follow a subject-and-author classification of articles, communications, and papers in the *Review* and *Papers and Proceedings* from 1911 to date; index of book reviews, excluding index of reviewers, to be included from 1930 to date. The classification of subject matter should be the groups or fields (eighteen classes) currently used in the *Review.*

It was recommended that 5,000 copies of the index be published and offered for sale to members of the Association. The Committee was of the opinion that the index could be sold for $1.00 per copy. The volume would probably exceed 400 pages in length. Preliminary estimates of cost ran from $7,500 to $8,000.

The Committee on Research and Publications also considered an alternative proposal to sponsor the construction of an index of the seven or eight leading English and American periodicals in economics for the last ten or fifteen years. A number of those consulted felt that such an index would be of greater value to the profession than an index of the publications of the American Economic Association alone. The cost of this project would be $10,000 to $12,000, depending on the coverage and the details of the indexing plan. The Committee felt that such a project would require foundation assistance.

Respectfully submitted,

SIMEON E. LELAND, *Acting Chairman*

REPORT OF THE EXPLORATORY COMMITTEE ON THE STATUS OF THE PROFESSION

A year ago Professor Clair Wilcox reported, as chairman, for the *Ad Hoc* Committee on Freedom of Teaching, Research, and Publication in Economics. (See *Papers and Proceedings,* May, 1954, pages 733-737.) This report analyzed the situation carefully and at some length. It first surveyed the Executive Committee's active concern for the preservation of freedom in these spheres—through its resolution of 1947 affirming "the free and untrammeled right" of college and university teachers to select textbooks and related materials in their teaching and research; through the establishment in 1948 of the past-presidents' Committee on Academic Freedom of which Professor Frederick C. Mills was chairman; and through the constitution in April, 1952, upon the discharge at its own request of the Mills committee, of the *ad hoc* committee for which Professor Wilcox reported in December, 1953. It also focused attention upon the major issues involved in this continuing concern of recent years.

The questions raised in the two committees thus established—and particularly in the discussions of the Executive Committee throughout the period—were stated and answered by the Wilcox committee as follows:

1. Should the Association undertake to prepare and publicize a declaration of principles of academic freedom for economists? *We think not.* [No italics in original.]

2. Should the Association undertake to investigate and report upon specific cases involving infringement of the academic freedom of economists? *Again, we think not.* [No italics in original.]

3. What other action, if any, should the Association take with respect to freedom of teaching, research, and publication?

. . . .

We believe a report should be prepared each year, and published in the annual volume of Papers and Proceedings, *on the status of the profession, including information on current attacks on freedom and apparent threats to freedom, on the conditions that promote freedom and on those that discourage it. We therefore recommend that the Executive Committee provide for the creation of a standing committee on the status of the profession to prepare such a report.* [No italics in original.]

In light of this recommendation, President Kuznets set up the present Committee, to explore "the need and scope of activity" for a standing committee on the status of the profession. "Before a standing committee is established," he wrote, "we must be sure that there is a useful field of activity to be pursued; and the possibility of pursuing it within the usual limitations of what any committee can reasonably be expected to do."

Some time after this exploratory committee was created, President Kuznets submitted to it a communication which he had received from Dr. Horace B. Davis, of the University of Kansas City, who had been discharged from his position as associate professor, of economics because he refused to answer questions concerning his political views or affiliations. Shortly thereafter, President Kuznets also had submitted to the Committee a letter from a group of French economists and one from a group of Austrian economists, protesting

the prosecution of Paul M. Sweezy for contempt of court, as a result of his refusal to answer certain questions in a New Hampshire investigation of subversive activities, as well as copies of correspondence between Dr. Sweezy and the Managing Editor of the *American Economic Review* with respect to the publication of a notice of this incident. Dr. Davis asserted "that the American Economic Association cannot afford to disregard this affront to one of its members and should take some action." Dr. Sweezy merely requested that the following item be published in the "Notes" section of the *Review:* "Paul M. Sweezy, formerly of the Harvard Economics Department, has been sentenced to jail in New Hampshire for refusing to answer questions, in a state investigation of subversion, regarding a lecture on the subject of socialism which he delivered in a course at the University of New Hampshire." In each instance President Kuznets requested the exploratory committee to "take a look" at the situation and advise him as to "what, if anything, should be done about it."

We will first deal with these specific cases.

With respect to the Davis case, the Committee advised President Kuznets that "there is nothing the American Economic Association can do or should do in the circumstances of this situation." Even if there were an appropriate sphere of activity for the Association in connection with individual discharges involving alleged infringement upon academic freedom and tenure, it seems probable that this would not be such a case, either for investigation or for action. From the material Dr. Davis has himself submitted it appears that he was discharged because of his unwillingness to co-operate with the university authorities and not because of his political views or his reliance upon the Fifth Amendment. In his own words, he was fired "for refusing to answer, not the Congressional Committee, but the Board of Trustees." In the judgment of this Committee, it is altogether reasonable and proper for a university, through its appropriate officers or agencies, to insist that those who constitute its faculty shall deal with it frankly and make available to it all facts and circumstances that may bear upon their status in the academic community. It must be recognized that reciprocal responsibilities govern the situation, and not merely a one-sided obligation unquestioningly to protect the staff member under attack. Only on such a basis can a university operate intelligently and effectively in safeguarding the intellectual freedom we all cherish. It appears that the American Association of University Professors sought to prevent the discharge of Dr. Davis, though without success; that the investigation of the case is being continued; and that Dr. Davis is "preparing a legal test of the University's action." While the final outcome will of course be of interest to economists, there appears to be no adequate ground for special concern on the part of the Association.

The Sweezy case is of a different character. As yet we have made no recommendation to President Kuznets and nothing has been requested of the Association by Dr. Sweezy other than to serve, through the *Review,* as a channel of communication with his colleagues in the profession concerning this experience.

When the incident was brought to the attention of the exploratory commit-

tee, we asked Dr. Sweezy for "the full story," particularly insofar as it might be available in published form. He sent us the August, 1954, issue of *Monthly Review*, which contains an article by Leo Huberman, coeditor of the journal with Sweezy, entitled, "The Daggett-Sweezy Case."

It appears from this account that at a closed hearing, on January 8, 1954, Sweezy answered questions, in an investigation by the State Attorney General of "subversive activities" and "subversive persons" within the state of New Hampshire, to the effect that he "was a Marxist and a socialist," that he "had never been a member of the Communist Party," that he "had never attended any meetings of the Communist Party anywhere," that he "did not, of his own personal knowledge, know any members of the Communist Party in the state of New Hampshire," and that he "did not now advocate, nor had he ever advocated, the overthrow of constitutional government by force and violence"; but that he refused to answer questions "concerning the Progressive Party or people alleged to be connected with it." A second hearing, also closed, was held on June 3, 1954. At this hearing Sweezy again refused to answer questions "concerning the Progressive Party and alleged members thereof"; and he also refused to answer questions "concerning a lecture on the subject of 'Socialism' which he had given at the University of New Hampshire on March 22, 1954."[1] He stated that neither in that lecture nor in any other lecture anywhere did he advocate the overthrow of constitutional government by force and violence; but he declined to answer any further questions concerning the lecture, on the grounds that such questions were beyond the scope of the inquiry authorized by the legislative resolution of 1953 "directing the Attorney General to inquire into violations of the Subversive Activities Act of 1951," and that they constituted "an invasion of constitutional rights of free speech guaranteed by the First Amendment." On June 28, on petition of the Attorney General, a court hearing was held, to compel answers to the disputed questions or to subject the recalcitrant witnesses to citation for contempt of court—"an offense for which the penalty in New Hampshire is normally jail until such time as the defendant choses to purge himself of contempt, which in this case would mean answering the questions." On June 30 the court upheld the position of the Attorney General. Sweezy was found to be in contempt and sentenced to jail; but over the objections of the Attorney General he was admitted to $1,000 bail, pending an appeal of the case to the Supreme Court of New Hampshire.[2]

While the article upon which the above account is based was "intended as a recital of facts and nothing more," and while it may doubtless be deemed

[1] "This was the third year," it was reported, "in which Sweezy had given the lecture on socialism," at the invitation in each instance of Dr. Gwynne Harris Daggett, associate professor of English and a member of the staff of the Humanities Course offered at the University. Professor Daggett had also been questioned at two closed hearings, and he likewise refused to provide information concerning the Progressive Party or the lecture on socialism.

[2] In the Daggett case, there was not only the threat of punishment for contempt of court, but the likelihood of discharge from his teaching post at the University. Accordingly, upon advice of counsel and numerous friends, and after receiving assurance from Sweezy that "the fight would be continued" and that "the case would be carried to the highest courts so that the important constitutional questions involved could be decided," Professor Daggett answered the disputed questions and the case against him was dismissed.

to be accurate and reliable, it is none the less an ex parte statement. Hence a full and properly-balanced knowledge of the facts must await further developments. Sweezy has promised to send to this Committee "printed copies of the record on which the appeal is being taken, and these will include not only the court proceedings but also the transcript of the hearings which went before." This material, together with such decisions of the appellate courts as may follow, will not only disclose all the relevant facts, but should throw revealing light upon the merits of the controversy.

As already noted, however, all that Sweezy requested was the publication of a brief notice of the matter in the *Review*. "I have many friends and acquaintances in the American Economic Association who are perhaps not likely to hear of this incident otherwise," he wrote to Professor Haley, "and I would appreciate your affording me this opportunity of informing them." Professor Haley felt that the problem ought to be attacked, not by broadening the "Notes" section of the *Review*, but through handling by the standing committee on the status of the profession, the creation of which was recommended in the report of the Wilcox committee. Sweezy replied that he did not mean to suggest that the inclusion of such items in the "Notes" "would be an adequate method of dealing with current threats to academic freedom so far as they affect the economics profession"; but he insisted that there remained, in any event, "a plain problem of communication" concerning attacks on economists' civil liberties for which the *Review* obviously afforded the best medium. In these circumstances he took the liberty of suggesting that the question of the publication of such notices be taken up with the Board of Editors as a whole or with such other body as is ultimately responsible for the policy of the *Review*. While Professor Haley readily expressed approval of this suggestion and promised also to bring the matter to the attention of the Executive Committee as an important problem in Association policy, he stated explicitly and incisively some of the difficulties involved in the Sweezy proposal, particularly as they bear upon implied expressions of judgment as to the merits of such controversies.[3] Thereupon Sweezy suggested a process of "continuous co-operation" between the *Review* and the recommended standing committee which would be calculated to eliminate the difficulties envisioned by the Man-

[3] Asserting that he believed it to be "the position of the Association officers that they are not ready or equipped to take a position on *individual* cases involving academic freedom or civil liberties," he continued: "I am sure that you believe that your proposal does not involve the Association in this way, since you regard it as simply designed to meet a 'plain problem of communication' through 'dissemination of factual information' But is it as simple as this? Do I take the responsibility for publishing every item of this sort involving an economist, in the form written by the complainant, describing from his point of view threats or actions that have the effect in his judgment of impairing his academic freedom or civil liberties? If so, do I attach to these items as published an editorial note disclaiming all responsibility for their factual accuracy? Do I stand ready to provide space also for replies and comments of others who cite different facts or place a different interpretation upon the facts from that given by the complainant? Or do I, or does some other agency of the Association, first conduct some sort of investigation of the accuracy of the facts cited in the complaint? If so, what facilities does the Association have for conducting such factual investigations? And is it not pertinent to point out that the Association would be assuming the responsibilities of the American Association of University Professors?"

aging Editor. He specified that civil liberties cases in which a member of the profession is concerned would be reported to the committee; and the committee would be charged with verifying the facts "and making a brief factual report in the next issue of the *Review* if it concluded that substantial issues were involved." The purpose of such a procedure, wrote Sweezy, "would not be to dispose of civil liberties cases nor to displace the AAUP, but simply to inform the profession"; and with this suggestion Professor Haley found himself in complete agreement.[4]

Since we have been constituted as an exploratory body rather than as an actions committee, the primary significance of these cases lies in their bearing upon the issues presented to us by the report of the Wilcox committee. In the judgment of this exploratory committee, they tend to confirm the soundness and wisdom of the Wilcox recommendations; and the same conclusions were reached by this Committee independently of these specific cases.

Negatively, the Wilcox committee found it inadvisable for the Association either to formulate any general declaration of principles concerning academic freedom of economists or to investigate specific cases of alleged infringement upon the academic freedom of economists. In reaching this conclusion, convincingly supported in its report, the Committee was confirming a like judgment by the earlier Mills committee on academic freedom. In its report to the Executive Committee dated March 22, 1952, it declared "that a policy calling for the active investigation and enforcement of principles of academic freedom is inappropriate and undesirable." In developing the reasons for this opinion, the Mills committee not only called attention to the "exhaustive on-the-ground investigations" of all cases and the "very considerable costs, in money and time," that would be involved, but, like the Wilcox committee, placed emphasis upon the fact that the handling of these matters is the special function of the AAUP. In its own words: "There exists a body created for the central purpose of defending academic freedom. Capable men have worked for many years through the AAUP on the complicated problems of academic freedom. A body of experience has been built up and a national reputation won by the AAUP in this field. Confusion, overlapping of effort, and waste could be expected if each professional society were to follow an independent program in

[4] On the same day on which Sweezy made his final suggestion to Professor Haley, he wrote as follows to the chairman of this exploratory committee: "It occurs to me that your committee may have some trouble connecting this case with the economics profession in a definite enough way to warrant your taking account of it. That would not surprise me, and I am not quite sure what my own answer would be. I sent the small news item, which you saw, to the editor of the *American Economic Review* because I wanted to find some method of communicating with the many people in the profession whom I know and many of whom I think would be interested in the case. I know from experience that this is not easy, some of my closest friends at Harvard when I was there having only just heard of the whole matter and that rather by chance. But whether the fact that a member of the profession—and I trust I qualify as such even though I am not now teaching at a University—is a victim in a civil liberties case which certainly involves academic freedom but is not immediately related to his status as an economist, whether this constitutes ground for concern on the part of the profession as such, I really do not know. I should hope so, if only because I think it would be better for everyone to overextend his interests in civil liberties rather than the reverse, but I am quite aware that my views in matters of this sort are likely to be different from those of others in the profession."

enforcing and protecting academic freedom." The present Committee is unequivocally of the same mind. As its chairman wrote President Kuznets on September 27 in advising him concerning the Davis case: "While I may be anticipating my committee's report of next December, I am constrained to say unhesitatingly that . . . the type of problem involved in the present-day drive against so-called subversives in our educational institutions concerns the academic community as a whole rather than particular disciplines, and that there is no distinctive sphere of activity for our Association as such in these controversies. The American Association of University Professors appears . . . to be the appropriate agency for safeguarding intellectual freedom in our colleges and universities; and if the AAUP is not proving to be an effective instrument for this purpose, it behooves university personnel as individuals, as well as the various professional organizations or learned societies with which they are affiliated, to seek to strengthen this over-all group or to establish a new and adequate over-all group in its place. It would be most unfortunate if the highly controversial concept of academic freedom as it emerges in the contemporary scene were to be defined and applied separately and independently by each of the many academic disciplines which might become involved. It is of the utmost importance that such a situation be avoided."[5]

But the Wilcox committee, while recognizing that the AAUP, with its more than 40,000 members and sizable annual budget, "still retains a substantial measure of prestige," declared it to be "lacking in vigor and effectiveness," and concluded that "the most important step that could be taken to preserve freedom of teaching, research, and publication would be the reinvigoration of the AAUP." The independent confirmation or denial of these judgments would require a more extended process of investigation than this exploratory committee could feasibly undertake. Its chairman did visit the Washington office and conferred with the general secretary. The impression carried away is that the AAUP's inadequate performance is due in no small measure, aside from temporary emergency considerations, to insufficient resources and an absence of sufficient activity on the part of the membership. This means too small a professional staff of full-time workers and too few part-time lay volunteers, in view of the constantly increasing burden of tasks that must be handled. It should be kept in mind, furthermore, that in the present climate of opinion and the prevailing investigatory techniques with respect to so-called "security risks," college and university personnel tend to become involved, not so much in the traditional distinctively-academic disputes, as in what amount in essence to general civil-liberty controversies; and that much of the AAUP's performance assumes the unspectacular form of more or less successful mediatory efforts. In any event, whatever the present shortcomings of the AAUP—and its Committee on Organization and Policy is working assiduously to find ways

[5] With reference to the specific grievance, the chairman wrote: "In the case of Dr. Davis of the University of Kansas City it appears to be entirely clear from his own account that the discharge was not grounded in the fact that he was an economist. There is every reason to believe that the same result would have followed if he had been an astronomer or an archaeologist. The fact that he is an economist, and a member of the AEA, is purely coincidental." In due course this communication to President Kuznets was approved by the other member of the exploratory committee.

and means of improving the situation—such shortcomings would be likely to be much more pronounced in the case of separate professional organizations or learned societies acting independently for the various academic disciplines. For investigations on the merits and for the exertion of pressures designed to safeguard freedom in teaching, research, and publication, we must continue to avail ourselves of the forty-year experience of AAUP, which came into being with the central objective of preserving and promoting academic freedom and whose principles and procedures in this sphere have received widespread approval.[6]

The affirmative recommendation of the Wilcox committee likewise merits full approval. While the tasks of formulating principles and procedures and applying them in individual cases should appropriately continue to be reserved to the AAUP, a broad and important interest none the less remains for the American Economic Association, as for other organizations of academic disciplines, in being kept informed concerning the aggregate experience of the membership of the profession and concerning the developments which tend to hamper or advance its contributions to knowledge, and insight, and fruitful scholarship. In the extraordinary circumstances of the contemporary scene, the information to be provided will tend to center upon "current attacks on freedom and apparent threats to freedom," as well as upon "the conditions that promote freedom and those that discourage it"; but the more general position of the profession is also a matter of legitimate concern for the Association. Hence the Wilcox group recommended that a standing committee on the status of the profession be established. The function of the committee, as a minimum, would be to prepare an annual report dealing with the aforementioned matters, to be published in the regular volume of *Papers and Proceedings* issued each year. Such a report should properly embrace not only developments with respect to college and university personnel but those concerning all members of the profession, whether they hold academic or governmental or business appointments or function independently as individuals. There can be no question, of course, that the Sweezy incident merits inclusion in such a report. But the usefulness of this provision of information would be greatly enhanced if accurate factual knowledge of relevant developments of substantial significance were made available on a more current basis. Hence the plan evolved by Dr. Sweezy and Professor Haley for quarterly publication in the *Review* of statements of facts verified by the standing committee concerning alleged infringements upon the academic freedom or civil liberties of economists fully approves

[6] See AAUP *Bulletin*, Spring, 1954 (Vol. 40, No. 1), which contains not only the 1940 and 1925 Statements of Principles, but the original 1915 Declaration of Principles of Academic Freedom and Tenure. It is interesting to note that at the organizational meeting of AAUP on January 1 and 2, 1915, "it was *voted* that the Association form a Committee on Academic Freedom and Academic Tenure, which should include members of a joint Committee on Academic Freedom and Tenure of the American Economic Association, the American Political Science Association, and the American Sociological Society, which had been constituted in 1913 to study and report on problems of academic freedom and tenure in teaching and research in economics, political science, and sociology." Three past presidents of the American Economic Association—Edwin R. A. Seligman, Richard T. Ely, and Frank A. Fetter—were members of this Committee which drew up the original Declaration of Principles and Professor Seligman was Chairman of the Committee.

itself to this exploratory committee. These quarterly reports would provide the principal materials for the annual surveys; and since the AAUP would constitute the primary source of the information utilized in these reports, the activities of the standing committee would provide a potential base for more general co-operation between the AAUP and the American Economic Association. The standing committee might well serve in an advisory capacity to AAUP investigating committees in such matters as involve the special competence of economists, and it might also exercise leadership in obtaining, when likely to prove helpful, the formal support of the Executive Committee for crucial AAUP actions. Finally, on the basis of its accumulated and continuing experience, it might submit recommendations to the Executive Committee from time to time for altering or expanding its own functions and responsibilities, as well as those of the Association as a whole, in relation to the AAUP and to the rights, duties, and opportunities of economists.

In summary, then, and in terms of the frame of reference established for us by President Kuznets, we find a clear need for the recommended standing committee; and we conclude that its scope of activity should be limited, at least for the time being, primarily to the provision of factual quarterly, if necessary, and annual reports, to be published respectively in the *Review* and in the *Paper and Proceedings*, concerning alleged infringements upon the academic freedom or civil liberties of economists, but to be supplemented by such general observations and recommendations concerning the status of the profession and the Association's relation thereto as might promise to be fruitful.

The thinking of the exploratory committee has been developed into a rather extensive report, in the hope of continuing the stimulus of the general membership of the Association provided in this sphere by the excellent report of the Wilcox committee. Toward the same end, we suggest that for the next annual meeting of the Association, the standing committee on the status of the profession, if established, might very usefully arrange a session on freedom of teaching, research, and publication in economics, so that the membership may be afforded an opportunity to participate actively in a discussion of these crucial problems of academic freedom and civil liberties.

I. L. SHARFMAN, *Chairman*
BEN W. LEWIS

REPORT OF THE *AD HOC* COMMITTEE ON ECONOMICS IN TEACHER EDUCATION

This Committee has had as its special concern the activities (and the problems that have prompted the activities) of the Commission on Economics in Teacher Education. Of necessity, however, the interest of the Committee has extended to other sectors in the broad field of economic education. Members of the Committee, as individuals, have participated in the work of the Joint Council on Economic Education (the parent body with which the Commission on Economics in Teacher Education is affiliated), with the Business Education Committee of the Committee for Economic Development, and in several other activities within this general area.

One significant fact has emerged clearly from our several experiences: economics is "on the march" in the schools, in business, and in adult and general education. In this connection it is getting a measure of attention from professional economists, but we believe that most members of the profession are only slightly aware of the force and character of the movement. There is great strength in the movement and, at least so far as sheer volume is concerned, it will make substantial strides in the years immediately ahead, either with or without the support of our profession. On the score of direction or quality, however, there is reason for uncertainty and even misgiving. Herein, it seems to us, as well as to many who have indicated their concern to us, lies an opportunity for and the responsibility of professional economists. If the level of economic understanding among the American people that results from this movement is lower than we believe to be good and if in the meantime we sit by, indifferent or uncertain and inactive, we have only ourselves to blame.

Members of this Committee are aware of the continuing interest of a sizable segment of the profession in the problems of teaching economics at the college level. We are aware of sporadic professional interest in economics in adult and general education and in the schools. And we are aware, also, of a growing "feeling" that in some way and in some degree the American Economic Association should play a more active and positive role in stimulating and helping to focus the interest and activities of its members in this entire area of economic education. There is diversity of opinion as to the precise part which the Association should undertake, but the belief is substantial and growing that the Association is not now carrying its full responsibility in this area. This matter needs exploration looking toward action.

In light of the foregoing, this Committee recommends that:

1. This Committee be continued as an *ad hoc* committee under the name of the Committee on Economic Education.

2. The Committee be instructed to explore and to bring findings and recommendations to the Executive Committee, if possible at its spring meeting, 1955, on the need for and the character of action properly to be taken by the As-

sociation to stimulate and to help to focus the interest of its members in the area of economic education; that is, the teaching of economics at the college level and in the schools (including teacher training), economics in business education (including "business" in economic education), and economics in adult and general education.

BEN W. LEWIS, *Chairman*
ARCHIBALD M. MCISAAC
PAUL J. STRAYER

REPORT OF OUR REPRESENTATIVE TO THE INTERNATIONAL ECONOMIC ASSOCIATION FOR 1954

During the calendar year 1954, the IEA held, aside from numerous sessions of its various working committees, two general meetings. The Executive Committee held a meeting in Paris, June 10-13, attended by all members, to make short- and long-range plans in view of the Ford Foundation grant extending over five years, from July 1 of this past year. Among other things, plans for an expanded program of round table conferences, with emphasis upon the participation of economists from the less developed countries, resulted from this meeting. The Executive Committee, in view of the growth of the number of member associations and the consequent increase in the size of the Council, decided to reduce the number of each association's delegates to the Council from four to two or from two to one, depending upon the category of the country.

A round table on wage determination was held September 4-13, at Seelisberg, Switzerland, with thirty-five participants from fourteen countries. The program was planned by John T. Dunlop (United States), Jean Marchal (France), and G. Demaria (Italy). A volume containing twenty background papers and a record of the Seelisberg discussions is being prepared and will probably be published, as earlier volumes have been, by Macmillan, London.

During the past year, the International Economic Association has published Volume 4 of the series of articles translated into English and bearing the title, *International Economic Papers*. A fifth volume is being prepared and it is hoped that, as in the case of Volume 4, UNESCO will contribute a subsidy of $1,000. A volume entitled, *Monopoly and Competition and Their Regulation,* edited by E. H. Chamberlin, contains the background papers and a record of the discussion of the round table held on this theme at Talloires (France) in September, 1951. The book was published by Macmillan, London, and is being sold in the US by the St. Martin's Press, New York. Sales of the volume have been good despite the price of $7.50. A condensed version of the papers and discussion of economic progress in the round table on this subject at Santa Margherita during the first week of September, 1953, has been published in UNESCO's *International Social Science Bulletin*, Volume 6, 2 (Summer, 1954). Complete texts of the papers and a fuller account of the sessions are being published in December, 1954, in mimeographed form by the Institut de Recherches Economiques et Sociales, at Louvain, Belgium.

For the more immediate and more distant future, the International Economic Association has plans in various stages of advancement for several round tables and other conferences. For three years, a committee under the chairmanship of Brinley Thomas (Cardiff, Wales; other members, Sauvy and D. Glass) has been perfecting a program on international migration, which is now scheduled for September, 1955, in Western Austria. The meeting will be partly supported financially by the Intergovernmental Committee on European Migration (Geneva). The Association is also planning a round table or seminar on

the economic development of Latin America, to be held under joint auspices with the Economic Commission for Latin America in December of 1956 at Rio de Janeiro. The Association committee—Howard S. Ellis for the Executive Committee, Eugenio Gudin (Brazil), Javier Marquez (Mexico), and Henry Wallich (United States)—has drawn up tentative plans. UNESCO will probably contribute $10,000 to this conference. During the coming summer, a refresher course in economics, planned by the IEA, represented by Austin Robinson, and the Indian Economic Association, represented by C. N. Vakil, will be held at a hill station in northern India. The purpose is to help Indian economists, particularly teachers of advanced students in the universities, to become or remain *au courant* in the recent developments of economics. The Indian government has made a substantial grant to finance the attendance of Indian economists, and the IEA will cover the expenses of four or five economists from Europe and the US who will offer courses. A similar refresher course for economists in the Middle East is being studied by two members of the IEA Executive Committee: Emile James (France) and Xenophon Zolotas (Greece).

Preparations are nearly complete for the First Congress of the International Economic Association, to be held September 4-9, 1956, upon the invitation of the Rector of the University, Professor U. G. Papi, at the University of Rome. Five principal speakers have undertaken to present main papers and these will be discussed by ten economists of international distinction. Announcements of this Congress are now being printed and will be inserted in the issues of national economic association journals appearing in the early months of 1955. The meetings are open to all members of all member associations. The text of main papers will be available at each session in translation into three or four languages, and provision will be made for stimultaneous or sequential translation of discussions. The theme of the Congress will be, "Stability and Progress in the World Economy."

For the more remote future, round tables are contemplated on the philosophical foundations of economics, being prepared by Alfred Stonier and Douglas Hague (University College, London); on the economic implications of the size of nations, preparatory explorations in December, 1954, in Paris by Austin Robinson, Lorie Tarshis, I. Svennilson, and Duquesne de la Vinelle; and on the development of southern Italy.

As far as concerns the relations of the AEA to the IEA, there are at present only two items of business—one rather routine and the other of considerable long-range importance. As for the first, consonant with the reduction of the size of the Council, the AEA should, prior to the Council meeting of 1956, select two of its present four representatives to be alternates rather than members and thereafter appoint only two members. As for the second, the Executive Committee of the IEA requests its constituent member societies to give early consideration to the problem of the finances of the IEA upon the expiration of the Ford Foundation grant. Perhaps a "hump" in the activities of the IEA is inevitable, but too great a decline after four years would be fraught with substantial disadvantages.

Respectfully submitted,

HOWARD S. ELLIS

REPORT OF OUR REPRESENTATIVE TO THE SOCIAL SCIENCE RESEARCH COUNCIL

Two years ago in reporting on the Council's activities I noted that a Rockefeller Foundation capital grant of $1,500,000 had placed the Council's finances on a more stable basis. At the Council's spring meeting this year President Herring reported that since September of 1953 the Council had received additional grants of over a million dollars. These grants are designed primarily to develop individual research and researchers rather than to promote group research projects. In a society in which bigness and organization are almost becoming fetishes, it has perhaps been inevitable that social science research should suffer from what has been aptly called "projectitis." The Council's renewed concern with the development of the research talents of and opportunities for the lone researcher seems particularly commendable. These grants make possible a continuation of the Council's research training fellowships, faculty research fellowships, first year graduate study fellowships, and the grants-in-aid program on a substantially larger scale.

Council activities of the past year of particular interest to economists include the work of the following committees: agricultural economics, business enterprise, census monographs, economic growth, labor market research, mathematical training of social scientists, and Slavic studies.

The Committee on Agricultural Economics reported at the Council's fall meeting that it hoped to complete soon its study of research on areas of persistently low incomes and low productivity, but it reported difficulties in financing its projected handbook on research techniques in agricultural economics. Meanwhile this project is inactive.

The Committee on Business Enterprise research met in February and July. It plans a conference in the fall of 1955 on "Expectations, Uncertainty, and Business Behavior" and a second conference in 1956 on some other aspect of research on the business enterprise. The committee's chairman, Howard Bowen, has completed his monograph on *The Business Enterprise as a Subject for Research* and the Council will publish it sometime in 1955.

Of the twenty monographs which it has projected, the Committee on Census Monographs has sent two to the printer: *American Agriculture, Its Structure and Place in the Economy* and *Income of the American People*. It reports that five others are nearing completion: *Older Population of the United States; Residential Financing; Social Characteristics of Farm, Village, Town and Urban Populations; Foreign Born and Ethnic Population Groups; Child and Youth Population*. Eleven monographs dealing with various aspects of the housing problem, occupational trends, structure of the labor force, internal migration, differential reproduction, and related topics are in a less advanced stage of preparation, while two have not yet been assigned.

The Committee on Economic Growth, under Simon Kuznets' chairmanship, is bringing to completion the program it projected some two years ago. The

Duke University Press is publishing the papers presented at the 1952 conference on economic growth in Brazil, India, and Japan. The Committee conducted four conferences during the past year, dealing respectively with strategic factors in periods of rapid economic growth, cities and their role in economic growth, entrepreneurship and economic growth, and economic criteria in investment plans for development. The Committee has arranged with economists in England, Germany, Italy, and Sweden to appraise estimates on national income and wealth extending back over a century or more and to report on their findings within a year after beginning the project. The Committee reports: that the International Association for Research on Income and Wealth, with headquarters in Italy, will publish the several papers on economic growth presented at the Association's 1953 meeting; that the Committee's chairman presented a paper entitled, "Toward a Theory of Economic Growth," at Columbia University's third bicentennial conference in May; and that at the invitation of the population division of the United Nations the chairman participated in a conference on plans for further research on the economic and social implications of population trends.

The work of the Committee on Labor Market Research is nearing completion. In June the Council published the Committee's final report on its study of labor mobility under the title, *Labor Mobility in Six Cities; A Report on the Survey of Patterns and Factors in Labor Mobility, 1940-50.* The Committee has published a second volume entitled *Labor Mobility and Economic Opportunity,* under the imprint of the Massachusetts Institute of Technology and John Wiley & Sons and a third volume on *Research on Labor Mobility; An Appraisal of Research and Findings in the United States,* authored by Herbert Parnes and appearing as Council Bulletin 65. After tentatively canvassing other directions in which research might be desirable, the Committee proposed that it be continued into the coming year to formulate its recommendations to the Council.

After obtaining reports from three-fourths of the participants in the 1953 Hanover institute on training in mathematics evaluating their experience, the Committee on Mathematical Training of Social Scientists has arranged for two institutes to be held simultaneously in the summer of 1955—one at the University of Michigan and one at Stanford. The Committee has also inaugurated three projects for preparing teaching materials for certain social science fields. Two are of particular interest to economists. Harold W. Kuhn is preparing problems and exercises in the theory of games and linear programing and Robert R. Bush is preparing similar materials in other areas of economics.

The Committee on Slavic Studies reports that the Rockefeller Foundation will meet one-half the cost of financing for the next five years the Committee-sponsored *Current Digest of the Soviet Press* and the Committee is taking steps to obtain the additional money needed to finance the work. In May, 1954, the Committee sponsored a conference at Arden House on "Continuity and Change in Russian and Soviet Thought," and the twenty-six papers presented at the conference are being edited for publication.

In 1947, at the request of the American Economic Association the Council helped in financing the translation of August Lösch's *Die räumliche Ordnung*

der Wirtschaft. After some delay occasioned by problems raised by the Alien Property Custodian, the work has been completed and the Yale University Press has published the translation.

In terminating my six years membership on the Council's Board of Directors, the last year as chairman, I wish to express appreciation to the Association and the Council for a stimulating and interesting experience.

Respectfully submitted,

GEORGE W. STOCKING

REPORT OF OUR REPRESENTATIVE TO THE AMERICAN COUNCIL OF LEARNED SOCIETIES

The main duty of the delegate is to attend the annual meeting, which was held in Rye, New York, in January, 1954. He also reads the minutes of all meetings of the Board of Directors. The main work of the Council must be learned from its published *Proceedings*. The shortened Council meetings of recent years are largely taken up with the routine of reports from the Executive Director (now Dr. Mortimer Graves) and other officers and staff of the Washington headquarters, of some of the committees through which the Council chiefly works, the election of officers, etc. Available time is devoted to discussion of general or timely topics of concern to the interest of scholarship in the country, hence to those who are chosen to speak for this interest, as organized in professional societies in the humanities and the social sciences.

For reasons that will be obvious in a general way, the organization has of late been increasingly concerned with relations between scholarly work and the government. There are matters of freedom of international movement of both materials and individuals; also the interruption of promising careers by draft for military service. Here the authorities have shown a disinclination to consider scholars in the fields represented as of special importance, particularly in comparison with workers in natural science. Further, the federal government is responsible for important scholarly activities and institutions. In January, 1954, the appointment of a Librarian of Congress was impending and reports indicated that considerations other than the best possible conduct of this vital agency were being pushed to influence the selection. The question of how far and how the Council or its twenty-four constituent societies should try to affect governmental action in such matters gave rise to some lively discussion, ending with the action that seemed most likely to receive consideration. An excellent statement in answer to the charges made against tax-exempt foundations by the Reece committee was prepared and submitted by Messrs. Graves and DeKiewiet.

At the present juncture, the matter that is naturally of most acute concern in ACLS circles is that the Council's existence is in jeopardy for lack of financial support. The occasion is that the foundations, which have long supplied the bulk of the "overhead" financing, the support of the central office and staff, have announced early discontinuance of grants for this purpose. At the meeting there was considerable discussion of the functions of the Council and methods of making the need for it appreciated by the foundations or other possible sources of support. From the AEA point of view, it is to be noted that the social science society constituents of the ACLS have been somewhat out of the main focus of its activities since the organization of the SSRC. This was not in prospect when the ACLS was set up, immediately after World War I, to represent this country in international relations of scholarship and re-

search in fields other than natural science. Your delegate would, however, express the conviction that the work of the ACLS and representation in it of the social sciences, alongside the more distinctly humanistic groups, is both of national importance and of substantial value to the former associations and their membership. If so, the AEA should co-operate in any suitable way in securing provision for the Council to continue with adequate support for effective work on at least the scale of recent years. I have no specific recommendation to offer in that connection at this time. The matter will undoubtedly receive the earnest consideration of our Executive Committee whenever there is any occasion for action.

Respectfully submitted,

FRANK H. KNIGHT

WORK OF THE NATIONAL BUREAU OF ECONOMIC RESEARCH IN 1954

Thirteen reports resulting from the National Bureau's work were published in 1954. On December 31 eleven were in press. Three were approved and about ready to go to press, and seven were being reviewed, or were soon to be reviewed, by the Board of Directors. A number of others were in an advanced stage of preparation and work on several new projects was under way and advancing effectively.

New Studies Started and Planned

New research in the field of international economic relations developed still further in 1954. A study of the structure of world trade and payments, the possibilities of which Herbert B. Woolley explored in 1952-53, was developed in 1954 with the assistance of a grant from the Ford Foundation. Earl Rolph undertook a brief exploratory study of change in the public debt of various countries since 1914, bringing into consideration related changes in price levels and currency valuation.

The review of what is known of the economic growth of Soviet Russia, started in the autumn of 1953 with the aid of a grant from the Rockefeller Foundation, was developed rapidly in 1954. It is being directed by Raymond W. Goldsmith and concerned primarily with the question: What has been the growth of Soviet Russia's output over the past three decades?

With the assistance of a grant from the Alfred P. Sloan Foundation, work was started late in 1953 and continued actively in 1954 on a project that will render an account of the course of money and real wages in the United States from the Civil War to the present day and of the changes at least since the turn of the century in the relations between the volume of output on the one hand and the quantities of labor and capital employed in production on the other. Leo Wolman is in charge of the wage study and John W. Kendrick is directing the work on productivity.

With a grant from the National Science Foundation, a study dealing with methods of determining the demand for and supply of scientific and technical personnel was started in 1954 by George J. Stigler.

Upon the suggestion of the Council of Economic Advisers– and in view of the widespread interest in the applicability of the National Bureau's business cycle investigations to the problem of forecasting—new studies in this area have been started under the direction of Geoffrey H. Moore. These studies are reviewing the possibilities and limitations of statistical indicators of cyclical swings, the measurement and interpretation of indexes of scope or diffusion of business fluctuations throughout the economy, and the usefulness for forecasting purposes of data on businessmen's expectations.

Ilse Mintz has begun an investigation of cycles in foreign trade of the United States; and Millard Hastay has begun a study dealing with "long cy-

cles" in economic activity for the purpose of throwing further light on the character and extent of long swings in our economy.

A study of postwar capital markets was planned in 1954 and a grant for its conduct was authorized by the Life Insurance Association of America. It is expected to be organized and operations begun in 1955.

Research associates appointed for 1954-55 and the fields in which they have started and currently have projects under way, are:

1. George Borts, Business Cycles—Regional Fluctuations
2. Michael Gort, Capital Formation and Financing
3. George S. Brinegar, Agricultural Finance

Universities-National Bureau Committee for Economic Research

The Universities-National Bureau Committee for Economic Research, which had been enlarged in 1950 to include twenty-eight universities offering graduate work in economics and emphasizing research, completed its first four years on June 30, 1954, and has now been continued for the period July 1, 1954-June 30, 1958.

Two Special Conferences, the fourth and fifth under the sponsorship of the Committee, were held in 1953. One of the two was on "Policies to Combat Depression," held at Princeton University in October. The second was on "Capital Formation and Economic Growth," held in November at the Carnegie Endowment International Center in New York.

The sixth Special Conference was held at Princeton University in May, 1954, and was devoted to further discussion of the same subject as the fourth; namely, "Policies to Combat Depression."

The seventh Special Conference was held in September, 1954, and was devoted to "Measurement and Behavior of Unemployment." Plans have been completed for the eighth conference, to be devoted to consumption economics, which will be held in 1955. A topic in international economics is proposed as the subject for the ninth Special Conference, to be held in 1956, and steps are now being taken to prepare plans for it.

The 1954 Annual Meeting of the Conference on Research in Income and Wealth was held in October of that year and was devoted to discussion of the comparability of national accounts. The 1955 Annual Meeting will be devoted to a review of the existing national income statistics of the United States.

Papers presented at the two Special Conferences on Policies to Combat Depression, held in October, 1953, and May, 1954, at the Conference in November, 1953, on "Capital Formation and Economic Growth," and those on capital formation presented at the 1953 Annual Meeting of the Conference on Research in Income and Wealth, are now being edited and prepared for publication.

Relocation of Offices

On May 1, 1954, the National Bureau moved its offices from 1819 Broadway and from "Hillside" to 261 Madison Avenue, New York City. The decision to move became necessary when the decision of the City of New York to build

the projected Coliseum at Columbus Circle and to demolish the building in which the National Bureau's offices were located became final late in 1953.

Directors, Officers, and Staff

C. Canby Balderston, elected Chairman of the Board of Directors at the 1954 Annual Meeting, resigned in August as Director by Appointment of the University of Pennsylvania and as Chairman of the Board upon his appointment as a member of the Board of Governors of the Federal Reserve System. Percival F. Brundage, elected President at the 1954 Annual Meeting, resigned in May as President upon his appointment as Deputy Director of the Bureau of the Budget. Harry Scherman was elected President to fill the unexpired term by resignation of Mr. Brundage.

John H. Williams was elected Director by Appointment of the American Economic Association to fill the unexpired term of Donald H. Wallace who died September 19, 1953. At the 1954 meeting of the Board, Melvin G. de Chazeau was elected Director by Appointment of Cornell University to succeed Paul M. O'Leary whose term of office had expired, and Solomon Fabricant was elected a Director at Large. C. Reinold Noyes, Director at Large, resigned as a member of the Board on June 30, 1954.

Solomon Fabricant, who had served as Acting Director of Research in 1953, was appointed Director of Research on March 1, 1954, to succeed Arthur F. Burns, who went on leave of absence on March 19, 1953, to serve as Chairman of President Eisenhower's Council of Economic Advisers.

George H. Borts, of Brown University, George Brinegar, of the University of Connecticut, and Michael Gort, of the University of California, were appointed research associates for 1954 and 1955.

Members of the Association may make suggestions relative to the work of the National Bureau either directly or through the member of the Board of the National Bureau by appointment of the Association.

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OTHER DEPARTMENTS

CHARLES HENRY HULL

Treasurer of the American Economic Association, 1896-99
Secretary-Treasurer, 1900 to June, 1901

Charles Henry Hull was born in Ithaca, New York, September 29, 1864. His life was devoted very largely to the activities of the city of Ithaca and Cornell University. He received his Ph.B. degree at Cornell in 1886 and except for two years, 1890-92, when he was a student at Gottingen, Halle, and Berlin, he spent his entire academic career at Cornell. He received his Ph.D. degree at Halle in 1892.

Hull's first appointment was in the Cornell University Library in 1886 and he became assistant librarian in 1887. After returning from abroad in 1892, he became instructor in political science and in 1893 was promoted to assistant professor of political economy, which post he held to 1901, when he was made professor of American history, the position which he occupied until he became emeritus professor in 1931. He died unmarried, June 15, 1936.

Although he always regarded teaching as his first obligation, he served as secretary of the University faculty, dean of the College of Arts and Sciences, and faculty member on the Board of Trustees. He also participated actively in community affairs, such as the Co-operative Society, the Town and Gown Club, the Community Chest, the Hospital Association, the Board of Education, the Chamber of Commerce, and Cornell University Library Association

Professor Hull published little, but not withstanding this fact, he achieved high distinction as a scholar. His edition of *The Economic Writings of Sir William Petty*, published when he was thirty-four years of age, was at once pronounced by competent critics a masterpiece of its kind.



Charles H. Hull

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RELATIVE PRICES AND AGGREGATE SPENDING IN THE ANALYSIS OF DEVALUATION

By FRITZ MACHLUP*

Two approaches to the question of the effects of devaluation have been presented as alternatives, and one of them has been treated as inferior, if not absolutely inappropriate.[1] The purpose of this article is to examine the supposedly superior approach and to give a comparative evaluation of both.

The problem is how to analyze the probable effectiveness of a devaluation undertaken to remove or reduce an existing excess demand for foreign exchange without the use of direct controls, when money incomes have been stable, and when no autonomous capital movements take place either before or after the devaluation. These restricting conditions serve to present the problem in splendid isolation from certain very realistic conditions—such as the presence of direct controls or of autonomous capital movements—from which abstraction must initially be made in a clean analysis.

We are not concerned here with the question whether devaluation is the "most appropriate" policy under given circumstances, or under what circumstances devaluation would be "more appropriate" than other policies. Our question is merely this: what is the best way of finding out whether devaluation will reduce the trade deficit, or what per cent of devaluation would eliminate a given trade deficit, or what size of a deficit would be eliminated by a given per cent of devaluation?

I refer to the two ways of analyzing the problem as the *relative-prices* approach and the *aggregate-spending* approach. Alexander called them the "elasticities approach" and the "income-absorption ap-

* The author is professor of political economy at the Johns Hopkins University.

[1] S. S. Alexander, "Effects of a Devaluation on a Trade Balance," Internat. Mon. Fund *Staff Papers*, Apr. 1952, II, 263-78.

proach."[2] There are other possible names: the "supply-and-demand approach" and the "income-and-outlay approach"; or, with an allusion to doctrinal history, the "Marshallian approach" and the "Keynesian approach" to the problem.

I. *Deficiencies of the Relative-Prices Approach*

The most widely used version of the relative-prices approach works with supply and demand curves for foreign exchange. The positions and shapes of these curves, and thus their elasticities at various points, are "deduced" from the supply and demand for exports and from the supply and demand for imports; and all these, in turn, are "deduced" from the supply conditions and demand conditions in all foreign and domestic markets, because every supply in foreign trade is an excess supply over domestic demand, and every demand in foreign trade is an excess demand over domestic supply.

Now the question has been raised whether one can take the shape of any of these curves as given; whether one can regard their elasticities as predetermined and use them in the solution of foreign-exchange problems. I had thought it useful to assume so,[3] and so had many others.

Given and Unchanged Cost Conditions

We said, for example, that the supply of exports would depend in part on "cost-conditions"—as if cost conditions were something definite. But is this defensible? The cost of *one* product can be shown in a curve, other things being given and unchanged; but if other things change, the cost curve no longer stays put; if the production of many goods is to change at the same time, we cannot easily know what the cost curve for any one of them will do.[4]

In the production of a certain good, productive resources are needed; for the production of more of that good, more resources are needed. If not much is happening elsewhere, one may foretell at what prices additional resources may be available, and one may, on the basis of technological knowledge, foretell what the cost of additional output will be. But for the prices of additional resources it will make a great difference whether at the same time these resources are being released by other industries or are being demanded by them in increased amounts.

[2] Alexander obviously means price elasticities by the first name, since income elasticity of demand plays a main part in the second approach.

[3] Fritz Machlup, "The Theory of Foreign Exchange," *Economica*, Nov. 1939, VI, 375-97, and Feb. 1940, VII, 23-49. Reprinted in *Readings in the Theory of International Trade* (Philadelphia, 1949), pp. 104-158.

[4] For an excellent exposition of the general problem of cost and supply curves, see Joan Robinson, "Rising Supply Price," *Economica*, Feb. 1941, VIII, 1-8. Reprinted in G. J Stigler and K. E. Boulding, ed., *Readings in Price Theory* (Chicago, 1952), pp. 233-41.

It is possible that, when the production of a certain product rises, say in order to provide increased exports under the stimulus of a devaluation, the production of other goods may be cut and productive services released to the expanding export industry. But it is also possible that some other industries will increase their output under the stimulus of the same devaluation, and that they also will require more of the same productive factors; and if several industries simultaneously demand these factors, their prices will rise. Where then are our "given" cost conditions?

Given and Unchanged Incomes

A second argument against the relative-prices approach is the possibility of changes in incomes. The devaluation itself may have income effects: incomes may rise or fall as a result of the devaluation. But the supply and demand curves are drawn, of course, on the basis of a given buying power, a given income. Thus, these curves will not help much if we know that incomes must have changed; we have to know how income has changed and how the new curves look.

Even if we did not allow total money income to change (and we shall return to this point), there is still the possibility of significant changes in income distribution. After all, devaluation will raise the domestic prices of imported goods which may be important in the budgets of certain groups; this would alter the distribution of real income. But if income distribution changes, demand is likely to change and our curves again may shift considerably.

That these arguments make it necessary to qualify and supplement the "simple" elasticity analysis had been clear to many.[5] But what Alexander suggests amounts to a repudiation of the relative-prices approach.[6] His arguments are persuasive and, with our confidence in

[5] The income effects of devaluation have often been discussed. I wrote: "If depreciation through its effects upon the volume of exports or upon the balance or the terms of trade should raise or lower total income, it would probably also raise or lower the demand for imports. These income effects of depreciation may be negligible in the beginning, but in the course of time, as the 'multiplier mechanism' becomes operative, they may become strong enough substantially to weaken or reinforce the price effects of depreciation." "Elasticity Pessimism in International Trade," *Econ. Internaz.*, Feb. 1950, III, 11. See also, J. J. Polak, "Discussion," *Am. Econ Rev.*, Proceedings, May, 1952, XLII, 180-81; A. C. Harberger, "Currency Depreciation, Income, and the Balance of Trade," *Jour. Pol. Econ*, Feb. 1950, LVIII, 47-60; T. Balogh and P. P. Streeten, "The Inappropriateness of Simple 'Elasticity' Concepts in the Analysis of International Trade," and "Exchange Rates and National Income," *Bull. Oxford Univ. Inst. Stat.*, Mar. and Apr. 1951, XIII, 65-77, 101-08.

[6] ". . . the total elasticities appropriate for the analysis of the effects of a devaluation depend on the behavior of the whole economic system, and the statement that the effect of a devaluation depends on the elasticities boils down to the statement that it depends on how the economic system behaves." ". . . it is suggested that a more fruitful line of

the criticized approach shaken or destroyed, we are eager to examine the novel approach that is offered as a superior substitute.

II. *Alexander's Aggregate-Spending Approach*

The new approach to the problem of the effect of devaluation is the aggregate-spending approach, or "income-absorption" approach. While following Alexander's exposition, I shall slightly change the notations.

The Fundamental Equation

The *total income* of a nation can be divided or classified into *consumption* plus *investment* plus *government contribution*[7] plus *exports* minus *imports;* or

$$Y \equiv C + I + G + X - M.$$

This identity is used as the fundamental equation; it can be shortened by merging the first three terms on the right side, that is by calling C plus I plus G by the name "absorption,"[8] or A. (The expenditures of households and business and governments are the part of the national income that is being "absorbed.") The two remaining terms of the identity, X minus M, the difference between exports and imports, constitute the trade balance, signified by B. Thus, what we now have is that the *national income* is the sum of the *absorption* by the nation plus its *trade balance;* or

$$Y \equiv A + B.$$

It follows that the trade balance must always be the difference between income and absorption:

$$B \equiv Y - A.$$

The trade balance is negative when the nation absorbs more than its income. The trade balance can improve if income increases while absorption increases less or stays unchanged or falls; or if absorption decreases while income decreases less or stays unchanged.

Devaluation Effects on Income and Spending

The question we now have to ask is to what extent devaluation can

approach can be based on a concentration on the relationships of real expenditure to real income and on the relationships of both of these to the price levels, rather than on the more traditional supply and demand analysis." Alexander, *op. cit.*, pp. 264, 263.

Balogh and Streeten also rejected the "elasticities approach": ". . . we shall contend that this approach to the problem is erroneous" (*op. cit.*, p. 65). But they did not suggest an alternative one: "It is regrettable but inevitable that no single new method of analysis can be put into the place of the old approach" (*ibid.*, p. 66).

[7] This term was not included in Alexander's exposition.

[8] This term was first used by K. E. Boulding, *Economic Analysis* (New York, rev. ed., 1948), pp. 402-8.

affect B, that is, the difference between income and absorption. Alexander breaks this down into three questions:[9] (1) How does devaluation affect income (Y)? (2) How does a change in income (ΔY) affect absorption (A)? (3) How does devaluation directly (that is, not via income) affect absorption (A)?

The change of the trade balance is the change in income minus the change in absorption; or

$$\Delta B \equiv \Delta Y - \Delta A.$$

The effect of devaluation upon income will show in ΔY; the effect of the change in income upon absorption, and the direct effect of devaluation upon absorption, will both show in ΔA. In other words, there will be an income-induced change in A and a nonincome-induced, or directly effected, change in A. The direct effect of the devaluation upon absorption can be expressed by δA. The income-induced change in absorption can be expressed by $\alpha \Delta Y$, where α is the "marginal propensity to absorb income" (which of course will be the sum of the marginal propensities to consume, to invest and to spend public funds).

The new symbols help to merge the devaluation effect upon income, ΔY, and the income effect upon absorption $\alpha \Delta Y$, into a single expression $(1 - \alpha)\ \Delta Y$, which stands for the nonabsorbed change in income. Thus,

$$\Delta B = (1 - \alpha)\ \Delta Y - \delta A.$$

Assume, for a moment, that income will increase as a result of devaluation. This devaluation effect upon income and the consequent income effect upon absorption will improve the trade balance only if α is smaller than unity. But, while the marginal propensity to consume is usually smaller than unity, α, the combined marginal propensity to consume, invest, and spend publicly, may well be greater than unity. If so, $(1 - \alpha)\ \Delta Y$, the nonabsorbed change in income, will be negative and the trade balance will deteriorate, rather than improve, on this score. Only the direct effect on absorption can then still help matters.

Alexander states that the analysis on the basis of his model will hold in real terms as well as in money terms; he then proceeds in the belief that he talks about real income, real absorption, and real trade balance throughout.

Following the clue from the last equation, Alexander divides the further discussion into two parts: the effects upon and via incomes—

[9] *Op. cit.*, p. 266

$(1 - \alpha)\ \Delta Y$—and the direct effects upon absorption—δA. He recognizes the following effects:

Effects upon and via Income $[(1-\alpha)\Delta Y]$	Direct Effects on Absorption $[\delta A]$
	Cash-balance effect
Idle-resources effect	Income-redistribution effect
Terms-of-trade effect	Money-illusion effect
	Three other direct absorption effects

The Idle-Resources Effect

If the devaluing country has idle resources, their employment can be increased by additional consumption, investment, government expenditures, or exports. Since C and I (and tacitly, G) are assumed by Alexander to be functions of income, additional exports are the strategic factor; and additional exports are the very thing that one should expect to result from devaluation.

The increased value of foreign moneys in terms of domestic money stimulates the production of export goods; if idle resources are available, employment will increase in the export industries; as the recipients of the income increment spend it for consumption, further employment may be created in the consumers-goods industries. This process is the familiar operation of the "foreign trade multiplier." But while the multiplier, in the customary exposition, includes only induced consumption, Alexander's employment effect comprises induced spending of all kinds.

Alexander inclines to the belief that α is greater than unity, that $(1 - \alpha)$ therefore is negative, and consequently that the trade balance will become worse as a result of the income increase due to the idle-resources effect of the devaluation. If improving the trade balance is the policy objective, it would follow that the devaluing country must hope either that there will be no increase in its income and employment, or that the propensity to absorb income is less than unity—or at least that the other effects of devaluation will be in the right direction and stronger than the idle-resources effect.

The Terms-of-Trade Effect

Alexander joins the majority of economists in the belief that devaluation will deteriorate the terms of trade of the devaluing country. He thinks that this is so because "a country's exports are usually more specialized than its imports."[10]

[10] *Ibid.*, p. 268.

If devaluation affects the terms of trade, the change in the terms of trade will affect national income and absorption. Alexander divides the terms-of-trade effects of devaluation on the balance of trade into an initial effect through price changes and a secondary effect through income-induced changes in absorption. He holds that "the normal result of a devaluation will be such deterioration of the terms of trade of the devaluing country as to" cause an initial deterioration of its balance of payments equal to "the reduction of the country's real income associated with the deterioration of the terms of trade."[11] In other words, the initial effect will normally be an equal and simultaneous reduction (deterioration) of the trade balance and of real national income. The secondary terms-of-trade effects of devaluation upon the balance of trade—the income-induced changes in spending—will depend on the marginal propensity to absorb income. The income-induced changes in absorption may either reinforce or attenuate the initial terms-of-trade effect on the balance of trade, or may turn it in the opposite direction.

Alexander, having concluded that the *initial* terms-of-trade effects upon trade balance and upon real income are (normally) equal in direction and in amount—he uses one symbol, t, for both—believes that he can find the ultimate terms-of-trade effect upon the trade balance by multiplying the initial effect by the marginal propensity not-to-absorb. Hence, the ultimate terms-of-trade effect upon the balance of trade would be $(1 - \alpha)t$, and thus could be positive (*i.e.*, improving the balance) only if (since t is assumed to be negative) $1 - \alpha$ is negative, that is, if α is greater than unity.

The Income Effects Combined

Alexander combines the two "income effects of devaluation" which he recognizes—the idle-resources effect and the terms-of-trade effect—in one expression equivalent to $(1 - \alpha)\ \Delta Y$. This presupposes that a change in the terms of trade resulting from devaluation will affect the balance of trade only through the change in real income, and to an extent commensurate with it.

Either or both of the income effects of devaluation may be zero. The idle-resources effect—"presumably positive," according to Alexander—can be positive only if there are unemployed resources and if their employment is not obstructed by bottlenecks (lack of complementary factors or lack of finance). The terms-of-trade effect may be zero if devaluation does not change the terms of trade, or if the "initial" effects on the trade balance as well as the "secondary" effects

[11] *Ibid.*, p. 269.

through income-induced changes in spending are checked or counteracted by monetary policy.

Direct Effects on Absorption

Effects of devaluation upon the balance of trade which are not associated with changes in income but only with changes in the absorption of a given income, are called "direct effects on absorption." If there is no change in income, the trade balance can be increased only through a reduction in the domestic absorption of income, C, I, or G, and an equal increase in exports or reduction in imports. Such a switch from A to B, from domestic absorption to foreign-trade balance, can possibly be accomplished without transfer of productive resources or changes in production if the reduction in domestic absorption relates to imported goods or to exportable goods. Otherwise it will require a shift of production from goods and services hitherto used for C, I, or G to goods and services for X, or to goods and services substituted for M. This will involve not only adaptations in production plans but ordinarily also a transfer of productive resources between plants, firms, industries, and locations. The question is, what mechanisms are set in motion by devaluation to induce these adaptations and transfers, and what obstacles have to be overcome in the process?

A reduction in consumption and investment can, in general, lead to a reduction in employment and income just as easily as to an increase in the trade balance.[12] Whether the productive resources released from domestic C and I industries will remain idle or will be transferred to industries producing X and substitutes for M, will depend chiefly on how the economy responds to price incentives; this need not involve price reductions, because the release of the resources will have been preceded by an increase in prices of export goods and of substitutes for import goods. Moreover, the reduction in spending for C and I will have been offset by an increase in receipts for X. But the chief object in Alexander's discussion of the "direct effects on absorption" is to examine whether and how devaluation may bring about the reduction in domestic spending.

The Cash-Balance Effect

Devaluation raises the domestic prices of imports and of exports; and it will tend to raise the prices of import substitutes, of potential exports, and of intermediate goods required for their production. Thus, unless the monetary authorities restrict credit in order to force price reductions in other sectors of the economy, the price level will be somewhat increased as a result of the devaluation.

[12] *Ibid.*, p. 272.

If the monetary authorities do not create more money than may be needed to purchase the foreign exchange forthcoming as a result of positive devaluation effects on the trade balance, the elevated price level will imply a reduction in the real value of total cash balances. Households and firms will attempt to build up their cash balances to the relative size they have found appropriate. They will try to do this by buying less and by selling assets and securities (debts).

Buying less in order to accumulate cash balances implies "a reduction in their real expenditures relative to their real incomes,"[13] that is, a foregoing of consumption and investment. Selling assets and debts securities will depress their prices or, which is the same thing, increase interest rates. The offer of assets and debt securities at reduced prices would attract foreign buyers—which would greatly help matters—but we have excluded any autonomous capital movements from our analysis. With foreigners ruled out as buyers—because we wish to abstract from capital inflows in order to concentrate on the trade balance—and with banks ruled out as buyers— because we have excluded additional credit creation—there are only nonbank residents left as buyers, and they will overcome their liquidity preference only if the prices of securities are so attractive that it pays them to defer real investment, reduce consumption, and part with liquidity. The increased interest rates will have the effect of cutting down investment expenditures of business and consumption expenditures of households.

The Income-Redistribution Effect

The lift in the price level that is associated with devaluation may also reduce aggregate spending from a given income by redistributing it from groups with higher to groups with lower marginal propensities to spend. Alexander mentions three such shifts of real income: from fixed-income recipients "to the rest of the economy,"[14] from wage recipients to profit recipients, and from taxpayers to government.

A loss of real income which the recipients of fixed income suffer through increased prices will result in a reduction of aggregate absorption if the corresponding gain in real income accrues largely to people richer and thriftier than rentiers, fixed-salary workers, and pensioners —which is not unlikely.

A shift of real income away from wage earners will occur when wage goods are among those whose prices are raised through devaluation— which is rather common. If the shift of real income is towards profit recipients, their investment incentives may be increased by more than

[13] *Ibid.*, p. 271.

[14] *Ibid.*, p. 273.

the consumption demand of the real-income losers is reduced. And if investment outlays increase accordingly, total absorption of income may be increased rather than reduced.

A shift from taxpayers to government would most effectively cut down aggregate spending where government expenditures are not dependent on tax revenues but are fixed in an inflexible budget not to be stepped up with a larger flow of tax receipts. Income-tax receipts would be increased where an income redistribution takes place in favor of richer people and tax rates are progressive. And income tax receipts would also be increased where total money income is allowed to increase in consequence of devaluation.[15]

The Money-Illusion Effect

This is what Alexander has to say on the money-illusion effect:

> The money illusion may contribute a favorable effect to a devaluation if it actually leads people to pay more attention to money prices than to money incomes. If at higher prices people choose to buy and consume less *even though their money income has increased in proportion,* over and above what can be attributed to the cash balance effect, the result on the balance of payments will be favorable. But *rising money incomes and rising prices may actually operate in the opposite manner;* for example, annual savings may be calculated in money terms and may fail to rise in proportion to money incomes and prices.[16]

It should be noted that Alexander speaks here, in the italicized clauses, not of higher prices of foreign-trade-connected goods, but of rising prices and of money incomes rising in proportion.

Other Direct Absorption Effects

Three other direct effects of devaluation upon absorption, and thus upon the trade balance, are mentioned by Alexander. One of them, which we may call the "price-expectations effect," may unfavorably affect the trade balance by increasing absorption: people expecting prices to rise following the devaluation may rush out to increase their inventories.

The other two are favorable influences on the trade balance. What may be called the "high-cost-of-investment effect" consists in the discouragement which increased cost of imported investment goods may cause to investors. Investment that requires foreign equipment. to be

[15] On the other hand, the revenues from specific import duties may be reduced rather than increased, and in many countries import duties are a significant portion of the budget.

[16] *Loc. cit.* Emphasis supplied.

imported at increased domestic prices, may be less attractive than it was before the devaluation and may be cut out altogether.[17]

The third effect generalizes the principle involved in the second effect to all kinds of imports: when certain goods, previously imported, become very expensive, some of the domestic buyers may give up buying these goods and may buy nothing instead. Alexander mentions this merely as a "theoretical possibility."

III. *Some Consequences of Neglecting Relative Prices*

My exposition of Alexander's analysis is, I hope, fair and accurate. In the first part of my critique I shall—without questioning the validity of the framework of the analysis or the merits of the procedure employed—point to some omissions and errors of reasoning which I believe can be attributed to Alexander's concentration on aggregate magnitudes and his neglect of relative prices. Although Alexander does not explicitly state that his enumeration of "income effects" and "direct absorption effects" is exhaustive, an impression is conveyed that, if not all, at least the more important ones have been covered. This, however, is not the case; we can find omissions in both categories.

The Resource-Reallocation Effect

There are three ways in which an increase in real national income can be achieved: through fuller employment of the available productive resources; through their better utilization and more economic allocation; and through more favorable terms of trade. Only two of these possibilities are recognized in Alexander's analysis: changes in the volume of employment and in the terms of trade. Transfer of resources to different uses does play a considerable role in his analysis, but only in connection with the direct absorption effects of devaluation. That such transfer may change real national income is not mentioned and has evidently been overlooked.

In the long run, greater economy and efficiency in the use of resources has been the most important factor in the increase in the living standards of the nations. In the short run, changes in the volume of employment and in the terms of trade may overshadow the effects of changed resources-use upon real income; but there is no presumption for one or the other to be more important. All three kinds of changes may be effected by devaluation (and each of them may be positive or negative).

[17] This seems to have been of considerable practical importance in several countries: Investment in imported labor-saving machinery, very profitable at predevaluation exchange rates, turned out to be too expensive relative to domestic labor once the exchange rates were corrected.

The "resource-reallocation effect" of devaluation may be especially significant when the "idle-resources effect" is negligible or zero; total employment may remain practically unchanged while the output produced may increase through a more economic or more efficient use of the resources employed. But it is also possible that both effects operate at the same time; more or fewer resources may be employed in a more or less economic way.

There are problems involved in measuring increases in real income when there are changes in the composition of output. Where the reallocation of resources implies a shift to "more valuable" products, with reductions in the output of "less valuable" products, the gain in real income can be measured only by means of a welfare index (based on market prices combined with other criteria). Even so, the principle that a reallocation of resources may increase the value of real output cannot reasonably be questioned. And where trade and production have been conducted on the basis of "unrealistic" exchange rates (overvaluing the currency) it is quite plausible that devaluation may effect a more economic use of resources with a consequent increase in real income.[18]

Substitution Effects

The resource-reallocation effect has been named here as another income effect of devaluation, although in Alexander's analysis resource reallocation is treated only in connection with direct absorption effects. But all of the direct absorption effects discussed by Alexander have to do with aggregate spending, with changes in the outlay of money; if they "work" to reduce total absorption they do so owing to the failure of some income recipients to spend all of their receipts or to make all the money expenditures they would otherwise have made.[19] Perhaps the most important absorption effects are thereby disregarded: the effects of shifts in relative prices and the effects of price increases which reduce real absorption even if absorption in money terms should be unchanged or slightly increased. This reduction in real absorption

[18] Besides the more economic resource allocation achieved through changes in relative prices, there may be two incidental resource-economizing effects of devaluation in systems operating with direct controls: one is the saving of administrative cost by government and by business when devaluation permits some controls to be removed and others to be improved; the second is the improved efficiency under the pressure of revived competition as the industry quota arrangements implied in the bureaucratic allocation of foreign exchange and imported materials are dropped when devaluation reinstates prices in the function of resource allocation.

[19] For example, in connection with the third of the three "miscellaneous direct absorption effects" Alexander says that "when the domestic prices [of imported goods] rise, the domestic purchasers cut their expenditures on these goods but save or hoard the difference, rather than shift the expenditures to other goods." *Op. cit.*, p. 274.

may be additional to that induced by a reduction in real income, although the increased prices may reflect such a real-income reduction.

Assume, for example (in order to isolate the outcome examined here from any terms-of-trade effects), that devaluation leaves the terms of trade unchanged, lifting the domestic prices of exports and of imports by the same percentage. As imported goods are now relatively higher in price than domestic goods, substitution in consumers' plans seems inevitable; and as exportable goods are now relatively higher in price than domestic goods, substitution in producers' plans seems inevitable; transfers of productive resources will ensue. And the increased demand for import-substitutes together with the reduced supply of domestic goods from the production of which resources have been diverted cannot but cause relative price movements which are apt to reduce the real value of aggregate absorption even if total money expenditures should be somewhat higher than before.

This reduction in real absorption will be additional to that induced by a reduction in real income if some among the substitutions induced take the form of shifts between consumption and asset holding (or indebtedness) or between investment and liquidity. Let us not forget that an import surplus implies an increase in indebtedness or decrease in the holdings of securities or other liquid assets on the part of some who absorb (consume or invest). Changes in relative prices may affect the willingness of "absorbers" to run up their debts or run down their liquid asset holdings. Substitution effects may significantly influence the absorption of real income and the physical volumes of imports and exports; these are price-induced changes in absorption, not predicated on any given "propensity to absorb" or on any general price level increase.

In all four kinds of direct effects on absorption discussed by Alexander, price movements play some role. But Alexander relies little on changes in *relative* prices to bring about the required adaptations and transfers.[20] Most of the time he looks to increased or rising price *levels* to do the trick. No wonder that he is disappointed in the performance.

The Terms-of-Trade Effect Amended

The neglect of the substitution effects impairs some of Alexander's analysis of the terms-of-trade effect of devaluation. It can be shown—although only in a lengthier exposition than we can here afford—that Alexander is in error when he holds that the initial effect—before any income-induced changes in absorption take place—will "normally" be an equal and simultaneous reduction (deterioration) of the trade

[20] Except in connection with the high-cost-of-investment effect.

balance and of real national income. To be sure, these two reductions can be made equal by definition, but it would be a rather useless definition; otherwise there is nothing that would cause the initial changes in trade balance and real income to be normally equal in amount or even in direction.

The source of Alexander's error in reasoning about the terms-of-trade effect lies in the conceptual decision to treat all effects of devaluation either as effects upon and via income or as direct effects upon absorption. Since a change in the terms of trade will affect income, Alexander at once puts the terms-of-trade effects under the first heading, and fails to notice that a change in the terms of trade will also affect absorption directly, through relative-price effects.

A change in the terms of trade may be viewed as a change in the ratio of an index of export prices to an index of import prices. The effects of relative price changes are customarily (following Hicks) divided into simultaneous income effects and substitution effects. By assuming that a change in the terms of trade will "initially" affect only income but not absorption, Alexander loses sight of the substitution effect. Absorption will actually be affected through both the substitution effects and the income effects of the change in the terms of trade. Thus, Alexander's conclusion that the ultimate terms-of-trade effect upon the balance of trade would be $(1 - a)t$, or equal to the income effect times the marginal propensity not-to-absorb, is wrong.[21]

IV. *Reasoning from Definitional Equations*

The argument underlying the aggregate-spending approach has been developed from a "fundamental equation" which represents mere definitions. Such equations usually serve a useful purpose in aiding the organization of the analysis. But they may easily tempt an analyst into "implicit theorizing," illegitimately deducing causal relationships, and overlooking the shifting meanings of terms in different contexts These temptations have not been successfully resisted in this instance.

Income and Output, Money Terms and Real Terms

As Alexander interprets the fundamental equation (or identity), "real income . . . is equal to the output of goods and services," and the relationships expressed "hold, of course, both in real and in money terms."[22] While this makes good sense for a closed system, it does not

[21] A clear exposition of the rather complicated relationships involved requires considerably more space, particularly because some fundamental questions concerning the use of terms-of-trade analysis ought to be explored at the same time. I reserve these tasks for a separate article.

[22] *Op. cit.*, p. 266.

for an open one, especially when the balance of trade plays a major role.

Even in a closed system there may be difficulties—due to problems of depreciation and depletion—in equating real income and output; but these difficulties can be defined away. In an open system where some output is produced for export, and imports contribute to consumption and domestic investment, output produced is not the same as real income. In order to relate output and income one would have to take account of changes in foreign assets and debts, as well as of unilateral transfers—items for which no provision is made in the equation. It is possible for employment, production, consumption, domestic investment, exports and imports, all to remain absolutely unchanged in physical terms, and for real national income nevertheless to be changed by some of the exports being sold at increased or reduced prices or given away free, or by some of the imports being bought at increased or reduced prices or received as gifts.

The conceptual difficulties implied in the possible deviations between changes in national product and national income[23] may have a significant bearing on the analysis of the effects of devaluation, especially in connection with changes in the terms of trade. What, for example, is the relevance of a "given" marginal propensity to absorb, when output and employment are affected one way, but income (with changes in foreign debts or assets) in another way? Will changes in absorption be induced by changes in employment and production or rather by changes in income that are partly due to changes in the foreign exchange reserves?

The supposed equivalence between relationships in money and in real terms is sometimes troublesome, occasionally even meaningless. Alexander intends to "deal only with real quantities, not with money values."[24] But what is a "real" trade balance? When a country has to pay increased prices for its imports and buys a slightly reduced physical quantity of imports, what is the meaning of an improved "real" trade balance if at the same time the balance in money terms has deteriorated? Or, should, perhaps, a trade balance in terms of money be translated into one in real terms by deflating the contracted foreign claims or debts by a price index? To treat exports and imports as "real quantities" makes sense; but can the difference between the two be meaningfully treated as a real (physical) quantity?[25] Can what is

[23] More correctly, possible deviations between changes in the total production of goods and services and in the total amount of income earned by the members of the economy. We are not concerned here with the difference between national income and disposable income.

[24] *Op. cit.*, p. 266.

[25] While horses and apples cannot be added, apples can be added *to* horses, but never subtracted *from* horses.

essentially an increase or decrease in foreign claims or debts be regarded as anything but a money value, however deflated?

Trade Balance in Foreign or in Domestic Money

But this is not all. Even if the concept of a trade balance in real terms is given up, the fact remains that, as a result of devaluation, an import surplus may increase in terms of domestic money and decrease in terms of foreign money. Indeed, this is a rather probable outcome.[26] But the ΔB in the equation $\Delta B \equiv \Delta Y - \Delta A$ is expressed either as a domestic money value or as the "real" equivalent of a domestic money value. This ΔB may be negative, so that a negative B may become even more negative, while the trade balance in terms of foreign money actually improves.

If one realizes that the whole purpose of the analysis is to find out what will happen to the trade balance of a country resorting to devaluation because of a shortage of foreign currency, one may be quite disappointed about the wrong result obtained. But, serious though it may sound, the damage is easily repaired by dividing $B + \Delta B$ by the increased exchange rate of the foreign currency: the deterioration of the balance in terms of domestic money may then show an improvement in terms of foreign money. It remains true, however, that $\Delta Y - \Delta A$ will not directly give the right answer.

Causal versus Ex Post *Relations*

The fundamental equation in the analysis, in the form $Y \equiv C + I + G + X - M$, is helpful in organizing an examination of the relationship between the components of aggregate spending and the foreign balance, but misleading if it is deemed to show causal (*ex ante*) rather than classificatory (*ex post*) relationships. For example, an increase in consumption expenditures may result in an increase in Y (if employment rises) or a decrease in I (if inventory is depleted) or a decrease in X (if exportable goods are domestically used) or an increase in M (if imports are purchased) or no real change at all (if prices of consumption goods rise); and there are many other more indirect possibilities and combinations—the study of which may be underemphasized by overconfident reliance on the "insight" afforded by the equation.

As a matter of fact, the equation gives very little insight into causal relationships. The merging of planned investment and unintentional inventory accumulation into one term, I, which in turn is part of A, is an example of an actually misleading "clue" suggested by the equation. Reduced consumption and reduced planned investment may some-

[26] See Machlup, "Theory of Foreign Exchange," *op cit.*, VI, pp. 375 ff. and *Readings*, pp. 104 ff.

times be offset by increased unintended inventory accumulation (due to the unexpected decline in sales). This latter part of ΔA is inversely related to ΔY as far as causal relationship is concerned; and, incidentally, the effects of devaluation upon planned inventory holdings may causally be more important than any positive relation between income and inventory investment.

The difference between causal and mere *ex post* relationships can perhaps be made clearer by asking for the meaning of the equation $\Delta Y \equiv \Delta A + \Delta B$. Obviously, if any two of these terms are given, the third can be calculated. But this is not to say that ΔB "depends" on $\Delta Y - \Delta A$ in any causal sense. To say this has no more merit than to say that ΔA "depends" on $\Delta Y - \Delta B$, or that ΔY "depends" on $\Delta A + \Delta B$.

Yet the "income-absorption" approach does rest on such "dependence" if it proposes that an investigation of the effect of devaluation upon the trade balance should proceed by analyzing the "basic questions" how devaluation affects both income and absorption.[27] With the same justification—or lack of justification—one might investigate the effect of devaluation upon national income by analyzing the "basic questions" how devaluation affects both absorption and the trade balance. And an analogous procedure might be proposed for an investigation of the effects of devaluation upon consumption and investment. Such an analytical merry-go-round is entirely "in character" whenever definitional equations furnish the sole basis for inquiry into presumably causal relationships.

Reversing the Direction of Causation

The income-absorption approach of analyzing the effect of devaluation upon B assumes that causation goes this way: devaluation affects Y; Y affects A; devaluation affects A directly; the net changes of Y and A determine the change of B.

At one point, however, the question of a reversible process is openly raised: if devaluation affects A directly, cannot A affect Y? No doubt, it can. If absorption is reduced as a direct result of devaluation, this may cause unemployment, partly or fully offsetting a positive idle-resources effect (due to increased activity in export industries) or even resulting in a net decline in employment and output.

In the event and to the extent that the directly effected reduction in absorption causes a net decline in employment (instead of the desired transfer of resources), a sequence of secondary nonspending will cut down consumption and investment even further, depending on the propensity to absorb; and if the transfer of resources should

[27] Alexander, *op. cit.*, p. 266.

still fail to take place, at least the purchase of imports will be reduced, with a definitely positive effect on the trade balance. Needless to say, no government would want to have the improvement of the trade balance take this form, but it is only fair to mention that it can happen. Analysts, however, may exclude this sequence of events by assuming that the government, pursuing a policy of full or high-level employment, will succeed in preventing a decline in employment.

V. *Implicit Shifts of Emphasis*

The income-absorption approach and the fundamental truism on which it rests may be helpful for the purpose of impressing the responsible leaders of the state as well as their economic advisers with the need "to recognize that, if the foreign balance is to be improved, the community as a whole must reduce its absorption of goods and services relative to its income."[28] At the same time the approach may be misleading in that it conceals the dependence of B (or of $Y-A$) on some key facts which can only be neglected at the risk of perilously obfuscating the policy problem.

The Role of Gold and Exchange Reserves

If no loans, investments, or repayments are received from abroad, there cannot be any negative B unless someone in the country is willing to give up foreign balances or other foreign assets. Ordinarily, the monetary authorities are the only willing sellers of foreign balances (or gold). If they do not sell, or have none to sell, the import surplus no longer exists; the real problem is not how to improve the trade balance, but whether to avoid its "automatic" improvement by the operation of "cruel" market forces—and how to make the unavoidable correction of the trade balance least painful or least harmful to the economy.

In a free market for foreign exchange—with no rate-pegging, rate-fixing, or rationing controls— there would surely evolve exchange rates at which all excess demand for imports is eliminated. One may ask *how*—by what forces and strains and stresses—this depreciation of the currency would succeed in balancing trade, but one cannot doubt that it would. A continuing import surplus, in the absence of autonomous capital imports, presupposes a policy of pegging the exchange rate by selling gold or foreign exchange; it disappears when that policy is discontinued.

The Role of Credit Creation

If no loans, investments, or repayments are received from abroad,

[28] *Ibid.*, p. 275.

there cannot be any negative *B* unless someone in the country is using previously inactive domestic cash balances (which is not likely to go on for very long), or new currency is printed, or the banking system, with the active support of the monetary authorities, engages in a continuing expansion of its loans-and-securities portfolio. If this continuing supply of domestic funds is not explained, one cannot understand how "propensities to absorb" can ever lead to absorption in excess of income.

The continuing supply of new bank credit need not be a continuing net increase in the supply of money. When the monetary authorities sell foreign exchange from their reserves, the domestic money (bank deposits) that is paid for it is canceled. The expansion of the loans-and-securities portfolio of the banks merely recreates the bank deposits canceled by the purchases of foreign balances from official reserves. To put it differently, the current credit expansion finances the current "excess absorption" by consumers and investors as well as the purchase of the foreign exchange that it requires.

Without continuing dishoarding or bank credit expansion, the negative trade balance could not continue. Every day of excess imports would bring a further reduction in the money supply of the people and, inevitably, a decline in absorption. A persistent import surplus, in the absence of autonomous capital imports, presupposes a policy of enabling the banking system to expand credit; it disappears when that policy is discontinued.

The possibility of credit expansion, incidentally, besides being a prerequisite of the maintenance of a negative trade balance and of any deterioration of the trade balance, is also essential in other phases of the operation of Alexander's model. In particular, the working of the idle-resources effect may depend on it. While some increase in employment can usually be financed by hitherto inactive liquid funds, by and large it takes new bank money to do this job.[29]

Assumptions about the Supply of Money

Nothing can be said about the effects of a devaluation unless exact specifications are made regarding the supply of money and credit and

[29] Alexander's attempt to combine his two income effects of devaluation in one expression and to treat them alike suffers not only from the defect that the terms-of-trade effect on the trade balance does not operate solely via income, but also that "finance" is no prerequisite for it. An increase in real income produced by the idle-resources effect must be accompanied by an increase in money income and money flow; on the other hand, a change in real income produced by the terms-of-trade effect may be merely a matter of relative prices and need not be reflected in a change in money income and circulation. This difference, neglected by Alexander, may be significant and has even its policy aspects, because inelasticity of the supply of money may be part of the monetary policy of a country or a built-in feature of its currency system, which would largely inhibit the operation of the idle-resources effect.

the fiscal policy of the government. There seems to be a tendency in the "New Economics" tacitly to regard the supply of money as a dependent variable rather than as a policy variable. In the "very old economics," where models of an unmanaged gold standard still had some applicability, the supply of money could be treated as a dependent variable. But when everybody has views on how the supply of money "ought" to be managed, and when in fact almost every government in the world does manage the supply of money, one may reasonably expect economic analysts to be explicit on this point and to state what happens under the various monetary policies which a government may choose to pursue.

On some occasions Alexander follows this good practice; for example, in discussing the cash-balance effect he first stipulates that "the money supply is inflexible." But in many places he fails to make such stipulations.[30] Indeed, he later returns to the cash-balance effect and calls it transitory because "the money supply may *respond* to the increased demand for cash balances."[31] As economists we should, I submit, make a clear distinction between a "response" explainable in economic terms (such as an increase in quantities of product supplied in consequence of increased effective demand reflected in higher prices and in greater profitability of an increased output) and a "response" explainable in political terms (such as an increase in the quantity of money—associated with increased government expenditures, reduced reserve requirements, increased open-market purchases by the central bank, etc.—either in consequence of political pressures or in anticipation of economic, social and political repercussions considered to be undesirable by the political powers). An economic response will be treated as a dependent variable; a political response should be treated as a policy variable and enumerated among the "special assumptions."

To assume tacitly, as is often done, that the money supply will "respond" to an increased demand for credit (to finance increased wage payments and increased foreign payments) may deprive an analysis, such as that of the effects of devaluation, of much of its meaning. To be sure, where the purpose of devaluation is to stimulate employment through the stimulation of exports, it will be the policy of the authorities to help supply the additional credits that are demanded. Even in this case the analyst should state what policy is assumed. But where the purpose of devaluation is to reduce or remove an excess demand for foreign money (that is, with regard to the external balance, an excess supply of domestic money), a policy of supplying the credit demanded

[30] *Op. cit.*, pp. 270, 273, although he speaks there repeatedly of "rising money incomes and rising prices."

[31] *Ibid.*, p. 274. Emphasis supplied.

to replace the excess demand that was squeezed out by the devaluation is not very consistent—even if it should be politically unavoidable.[32]

VI. *Comparing the Two Approaches*

Given and Unchanged Parameters

The reason given for advancing the aggregate-spending approach was that its predecessor the relative-prices approach suffered from incurable deficiencies. The basic trouble of the latter is that it works with price elasticities which presumably are given and knowable, but actually are neither —and are even changed as a result of the very devaluation effects which they are supposed to determine.

The new approach assigns strategic importance to spending propensities. Since these spending propensities are supposed to determine the effects of devaluation upon the trade balance, the impression is created that a, the marginal propensity to absorb, is both given and knowable. Actually it is neither; indeed, we have every reason to believe that a is not stable over time and that it may change not only with the mood of the time but also momentarily according to the circumstances of the situation. Although called a "propensity" to absorb income, it contains both intentional and unintentional reactions, including unintended investment or disinvestment in inventories, which sometimes may offset the effects of intentional reactions; it comprises government expenditure (inclusive of public capital expenditure), which is not a function of income but an independent variable that can be administered in a direction opposite to that of changes in income; even in so far as it refers to private actions, it may be significantly influenced by monetary and fiscal policy; and, finally, it may be substantially changed as a result of the very devaluation the effects of which it supposedly determines.

Hence, what was said about the "elasticities approach," namely, that "the statement that the effect of a devaluation depends on the elasticities boils down to the statement that it depends on how the economic system behaves,"[33] may with equal justification be said about the income-absorption relation. For, after all, the devaluation effects upon income and absorption, including the supposedly given "propensities to absorb," depend "on how the economic system behaves"—and, we may add, on how it is made to behave by monetary and fiscal policies.

From the point of view of stability over time it is hard to say which of the parameters are less reliable as indicators of the effects of devalua-

[32] Even in this case a policy of devaluation may be adopted with the idea of taking advantage of lags and of gaining a breathing spell between devaluation and re-inflation.

[33] *Op cit*, p 264.

tion on the trade balance—the price elasticities or the spending propensities. From the point of view of changeability in the very process the outcome of which they help determine, the spending propensities are probably less reliable than the price elasticities. And from the point of view of malleability through public policy, one probably should regard the price elasticities as the tougher factors to deal with, and the spending propensities more subject to the influence of (monetary and fiscal) policy—which means that in the last analysis not given propensities but chosen policies will determine the outcome.

Foreign Supply and Demand Conditions

An explanation of the volume, composition, terms, and balance of trade between nations can hardly be regarded as fully convincing if it takes account of the conditions in only one of the nations concerned instead of considering all parties involved. The relative-prices approach attempts to satisfy this precept by including the supply and demand conditions in foreign markets among the determining factors. In particular the elasticities of foreign demand for the exports and of foreign supply of the imports of the devaluing country are assigned important roles.

The aggregate-spending approach makes no such provision, at least not explicitly. It attempts to deduce the devaluation effects on the trade balance solely from the effects upon national income and absorption in the devaluing country. Since the "resulting" change in the trade balance is necessarily also a change, by the same amount though with opposite sign, in the trade balance of the trading partner—perhaps the rest of the world—one wonders how this change is imposed, so to speak, on the latter, regardless of the magnitudes of their spending propensities, etc. If only the ΔY and ΔA of the devaluing country were to determine the outcome, would this not imply that in the other countries changes in income and absorption would be "dictated" by a change in the trade balance, instead of the other way around?

Alexander's analysis is silent on this point. An enterprising builder of aggregative models might set out to construct a two-country model embodying the income-absorption relations based on the spending propensities in both countries affected by the change in foreign exchange rates. But I am not convinced that this would be a worth-while undertaking. It is probably more expedient to assume that "the foreign country" is the rest of the world, that the world-wide income and absorption effects of the devaluation of the one currency are so widely dispersed as to be negligible, and that therefore the elasticities of foreign demand and foreign supply are not sufficiently altered to lose

their determining force on the outcome.[34] But this solution would obviously restore the elasticities approach to at least half its former role in the analysis of devaluation.

Price Elasticities in the Spending Approach

As a matter of fact, this restoration of relative prices and price elasticities to a strategic position in the model is not left to its reconstruction by future renovators; price elasticities have been allowed to continue all along, though inconspicuously, to do their job under the new regime. Supposedly banished under the aggregate-spending approach, they have in fact played important roles in Alexander's analysis.

At some points the elasticities work behind the scene. For example, whether there can be an idle-resources effect of devaluation depends on whether the production and sale of export goods can be expanded, hence, on elasticities of domestic supply and of foreign demand; but this is not explicitly said. At other points the elasticities are clearly visible on the stage. For example, whether a direct devaluation-effect upon absorption will result in a transfer of resources or in unemployment, depends on "how the economy responds to price incentives,"[35] or on the "price differential between the foreign and the domestic markets" and on "the substitutability of domestic goods for imports in consumption, and of resources as between the production of domestic goods and exports."[36] At one point at least, the role of price elasticities is dominant: in the terms-of-trade effect. For it is impossible to come to any conclusion concerning the effects of devaluation upon the terms of trade except on the basis of an examination of the relevant elasticities of supply and demand.

Alexander would probably deny none of this. For, although he regards aggregative analysis as "a more fruitful line of approach," to be adopted in lieu of "the more traditional supply and demand analysis,"[37] he concedes that "supply and demand conditions, in the sense of partial elasticities, may be useful tools in this [income-absorption] analysis."[38] His objection is to discussions in terms of "total elasticities" and he believes that it is "total elasticities for which the conventional formulas alone are valid."[39]

[34] This suggestion was made by Michael Michaely, *Devaluation and Dual Markets under Inflation with Direct Controls*, a doctoral dissertation submitted to Johns Hopkins University, January, 1955.

[35] See above, p. 262.

[36] Alexander, *op. cit.*, pp. 270, 271

[37] *Ibid.*, p. 263.

[38] *Ibid.*, p. 275.

[39] *Ibid.*, p. 275. These "formulas," as I have understood them, had no other purpose than to suggest qualitative (directional) relationships and quantitative possibilities. Alex-

Conclusion

The upshot of all this is that relative prices and elasticities were not really discarded in the analysis of devaluation effects; and that aggregate spending and propensities by themselves cannot possibly do the explanatory job that was assigned to them. Neither of the two "alternative" sets of tools can be spared; both are needed.

Alexander, I am afraid, has confused his readers by presenting the new approach as a substitute for the old. If clearly presented as complementary to the old, and properly amended, the new analysis can be helpful. The new tools fashioned by Alexander cannot replace the old tools of "conventional analysis"; but they can, after some substantial reshaping, increase the usefulness of the latter.

It is the habit of innovators to disparage the old ways of doing things; it is the duty of critics to appreciate the value of the new without depreciating the value of the old. In trying to pare down the exaggerated claims of the innovator they are sometimes overly critical of the new ideas. Lest I have erred in this direction, I should like to end by paying my respect to Alexander's innovating enterprise and to his contribution to the development of international trade theory. A contribution it is, and an especially meritorious one where it gives scope to the roles of both aggregate spending and relative prices.

ander must have mistaken them for operational devices or for mere *ex post* relationships. If he means "*ex post* elasticities" when he says "total elasticities," he surely misunderstands most of those who have argued in terms of price elasticities I, for one, have always had *ex ante* elasticities in mind.

THE THEORY OF FLEXIBLE EXCHANGE RATES

By E. VICTOR MORGAN*

Until quite recently, it was generally believed that a fall in the exchange value of a currency would improve the balance of trade and worsen the terms of trade of the country concerned. During the interwar period, when there was a growing consciousness of the difficulties of reducing the domestic price level through a deflationary monetary policy, it became quite fashionable to advocate flexible exchange rates as the best means of maintaining international balance. Underlying this preference was the belief, not only that depreciation would be effective in correcting an adverse balance, but that it would do so at a cost (in the deterioration of the terms of trade) which would be less than the cost of other forms of adjustment.[1]

The growth of interest in exchange flexibility as a policy led naturally to a parallel development of theoretical studies. The regrettable thing, in the opinion of the present writer, is that these studies concentrated on the concepts of elasticity of supply and demand, and largely ignored the fundamental developments in the pure theory of foreign trade, which were going on at the same time.[2] The main object of this paper will be to submit that results based on these elasticities are subject to severe limitations in theory and are misleading in their policy implications. First, however, it is necessary to give a very brief summary of the theory which it is proposed to criticize.[3]

The basic concepts are four elasticities: the home elasticity of demand for imports (ε_i), the foreign elasticity of supply of imports (η_i),

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[1] That is, the idle resources associated with deflation, and the loss of efficiency in the use of resources resulting from direct import restrictions.

[2] Notably the "proportions of the factors" analysis developed by Heckscher, Ohlin and Samuelson: *e.g.*, E. F. Heckscher, "The Effect of Foreign Trade on the Distribution of Income," *Ekonomisk Tidskrift*, 1919, XXI (2), 1-32, trans in H. S. Ellis and L. A. Metzler, ed., *Readings in the Theory of International Trade* (Philadelphia, 1949), pp. 272-300; B. Ohlin, *Interregional and International Trade* (Cambridge, Mass., 1933); P. A. Samuelson, "International Trade and the Equalisation of Factor Prices," *Econ. Jour.*, June 1948, LVIII, 163-84; *idem*, "International Factor-Price Equalisation Once Again," *Econ. Jour.*, June 1949, LIX, 181-97.

[3] I shall not attempt to give a full list of the many papers in which these matters are discussed, though a number of them will be cited later.

the foreign elasticity of demand for exports (ϵ_e) and the home elasticity of supply of exports (η_e). Considering only the trade balance, and starting from a balanced position, it has been shown that a small proportionate fall in the exchange rate (K) will produce a favorable balance, as a proportion of the original value of exports, of

$$K \cdot \frac{\epsilon_i \epsilon_e (1 + \eta_i + \eta_e) + \eta_i \eta_e (\epsilon_i + \epsilon_e - 1)}{(\epsilon_i + \eta_i)(\epsilon_e + \eta_e)}$$

This must be positive if the sum of the two demand elasticities is greater than unity, and it may be positive, even if the sum of the demand elasticities is less than unity, provided that the supply elasticities are sufficiently small.

The corresponding formula for the deterioration of the terms of trade is

$$K \cdot \left(\frac{\eta_i}{\epsilon_i + \eta_i}\right) - \left(\frac{\epsilon_e}{\epsilon_e + \eta_e}\right) = K \left(\frac{\eta_i \eta_e - \epsilon_i \epsilon_e}{(\eta_i + \epsilon_i)(\eta_e + \epsilon_e)}\right).$$

This will be positive, and the terms of trade will turn against the depreciating country if $\eta_i \eta_e > \epsilon_i \epsilon_e$, that is if the product of the supply elasticities exceeds the product of the demand elasticities. Mrs. Robinson's condition ($\frac{\eta_e}{\epsilon_i} > \frac{\epsilon_e}{\eta_i}$ in our notation) also follows from this formula.[4]

Each of these elasticities is a derived concept. For example, a fall in the price of an imported good would lead both to an extension of demand and to a contraction of domestic supply (if it were also produced at home). The resulting extension of the demand for imports is made up of the sum of these two changes. In order to set out the relationships concisely let D = volume of demand, S = volume of supply, and Q = volume of imports (all before the price change); let h = the home country and w = the rest of the world. Then we have:

$$\epsilon_i = \frac{\epsilon_{hi} D_{hi} + \eta_{hi} S_{hi}}{Q_i}$$

$$\epsilon_e = \frac{\eta_{we} S_{we} + \epsilon_{we} \cdot D_{we}}{Q_e}$$

$$\eta_i = \frac{\epsilon_{wi} D_{wi} + \eta_{wi} \cdot S_{wi}}{Q_i}$$

$$\eta_e = \frac{\eta_{he} \cdot S_{he} + \epsilon_{he} \cdot D_{he}}{Q_e}$$

[4] Joan Robinson, *Essays in the Theory of Employment* (London, 1937), p. 21 n

The condition for a deterioration of the terms of trade as a result of depreciation can then be written:

$$\frac{\epsilon_{wi} \cdot D_{wi} + \eta_{wi} \cdot S_{wi}}{\epsilon_{hi} \cdot D_{hi} + \eta_{\epsilon_i} \cdot S_{hi}} > \frac{\eta_{we} \cdot S_{we} + \epsilon_{we} \cdot D_{we}}{\eta_{he} \cdot S_{he} + \epsilon_{he} \cdot D_{he}}$$

So far as the quantitative weights are concerned, a high value on one side of this expression is very likely to be associated with a high value on the other. As for the ratios of the respective elasticities, there seems no a priori reason for supposing that one need be higher than the other. Apparently depreciation would tend to raise the prices of both imports and exports in relation to those of nontraded goods, but the formula gives us no reason to suppose that one would necessarily rise more than the other.[5]

It thus appears that depreciation may, according to the structure of the economies concerned, cause both the terms of trade and the balance of trade to move either way. Moreover, since the change in the terms of trade depends on the ratios of the elasticities, while that in the balance of trade depends on their absolute magnitudes, there is no necessary relationship between them. So far from moving, of necessity, in opposite directions, it is quite conceivable that both might improve or both deteriorate as a result of depreciation.

Writers who have treated the subject in this way have generally concentrated on the trade balance alone, ignoring invisible items, capital movements, speculation and the hoarding of foreign currencies. In such a model, a tendency for the balance of trade to deteriorate[6] as a result of depreciation implies a situation of unstable equilibrium in the foreign exchange market. No one has assumed that the markets for the goods entering into trade are in unstable equilibrium, so we have the strange phenomenon of a series of apparently stable goods markets producing an unstable currency market, even though the currencies concerned can be used for no other purpose than the purchase of goods. To one who was brought up on the relatively simple notions of traditional economic theory, all this seems more than a little odd. A number of estimates of

[5] Mrs. Robinson gives reasons why depreciation should lead to an adverse movement based largely on the generalization that, "Any one country plays a more dominant rôle in the world supply of those goods which it exports than it plays in the world market for those things which it imports" (*op. cit.*, p. 219). I doubt if this is universally true, but it is certainly true of some countries; and where it is true, our formula suggests that a deterioration in the terms of trade is a likely consequence of depreciation.

[6] In a model which excludes capital movements, there can be no actual deterioration of the balance. The only meaning which can be attached to the term is the creation of the excess of demand for the foreign currency over its supply.

demand elasticities have been published.[7] Most of them have been surprisingly low, some so low as to cast grave doubts on whether depreciation would be effective at all. The result has been something of a revulsion against the policy of flexible exchange rates. If one accepts both the statistical estimates and the theory underlying them, it is hard to avoid the conclusion that, if flexible rates worked at all, they would do so only at the cost of very violent and disturbing fluctuations. This pessimistic conclusion is by no means out of keeping with the general climate of opinion which is prevalent in some quarters. If one cannot correct an adverse balance by reducing domestic prices for fear of unemployment, industrial strife and bloody revolution; and if exchange depreciation is ineffective, then the only way must be through direct controls. Those who, on other grounds, are inclined towards direct controls can thus take some satisfaction in this apparent vindication of their beliefs.

There have been a number of refinements of the theoretical concepts, some of which will be mentioned later, and the statistical estimates have been subjected to devastating criticism by G. H. Orcutt.[8] There has been little attempt, however, to relate the new apparatus to the theory of international values, and it is when viewed in this light that the whole elasticity approach appears, to the present writer, untenable.

The basic weakness lies in the use of the concept of elasticity itself. Its original and proper use is, of course, to describe a simple functional relationship between volume of sales and price. This implies that the commodity must be sufficiently homogeneous to be measured in physical units, and that all other relevant variables (including money income and the prices of all other goods) must be unchanged. These are the familiar assumptions made in the partial equilibrium analysis of supply and demand for a single good, but they are far removed from what actually happens in the course of international trade.

For a full picture of the adjustment process we need to go behind the goods markets to the factor markets, and to follow the sort of analysis made familiar by Ohlin.[9] Suppose that we have two countries, A and B, endowed with factors of production, $f_1, f_2, \ldots f_n$. Call the currency of A dollars and that of B sterling. Take the amount of each

[7] *E.g.*, J. H. Adler, "United States Import Demand during the Interwar Period," *Am Econ. Rev.*, June 1945, XXXV, 418-30; T. C. Chang, "International Comparison of Demand for Imports," *Rev. Econ. Stud.*, 1945-46, XIII (2), 53-67; *idem*, "The British Demand for Imports in the Inter-war Period," *Econ. Jour*, June 1946, 188-207; *idem*, "A Statistical Note on World Demand for Exports," *Rev. Econ. Stat.*, May 1948, XXX, 106-16.

[8] G. H. Orcutt, "The Measurement of Price Elasticities in International Trade," *Rev. Econ. Stat.*, May 1950, XXXII, 117-32.

[9] *Op. cit.*, esp. pp. 28 *seq.*

of the factors which can be bought in A for $1 and find the respective prices of these amounts in country B. Convert these prices into dollars at any given exchange rate, and arrange the factors in ascending order of price. The resulting range might look something like the line $B_1B'_1$ in the diagram below, where each dot represents a factor of production. The corresponding A prices would be represented by the horizontal line AA′, since we have taken a dollar's worth of each factor as a unit of measurement. Now suppose the pound to depreciate against the

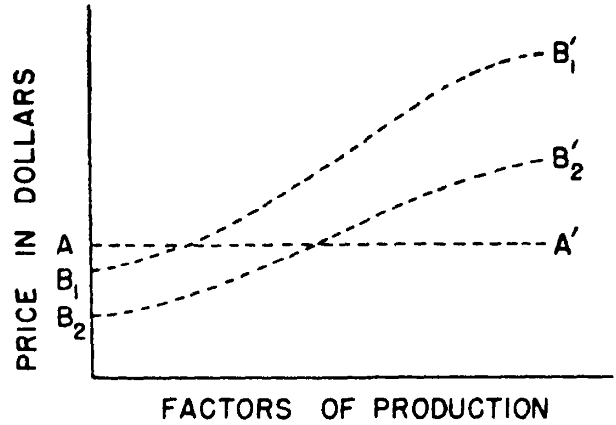


FIGURE 1

dollar. The immediate effect will be to produce an all-round proportionate reduction in the dollar prices of B factors. Instead of $B_1B'_1$ we shall have a range such as $B_2B'_2$. This is the fundamental impact effect of depreciation, a cheapening not of the goods, but of the factors of the depreciating country.

From the cheapening of factors, there naturally follows a cheapening of goods, but the relationship is by no means simple. It will become profitable to export some goods not previously exported, while some which were previously imported will be produced at home. There will also be changes in the relative importance of different goods both in the import and export lists. In the depreciating country there will be an increase in the demand for factors from the export industries and those producing goods competing with imports. Some factors, which are in elastic total supply or which can readily be drawn from other industries, will change little in relative price. Others, for which a strong demand is coupled with an inelastic supply, will rise sharply. Apart from the production functions of the expanding industries and the demand functions for their products, there are at least three influences on the availability of factors: the elasticity of their total supply, their

elasticity of substitution and the elasticity of demand for the products of other industries in which they are used.

Industries using a large proportion of those factors which remain relatively cheap will expand much; others which use a preponderance of factors which are rising sharply in price will have their expansion cut off at an early stage. Similar changes will be going on, in the opposite direction, in the countries which do not depreciate. There is thus a kaleidoscopic movement both among goods and among factors, which will come to an end only with a new general equilibrium of the whole system. All these changes are masked by the concept of an elasticity of demand for imports and exports as a whole.

All this is familiar ground to any undergraduate student of value theory, yet there has been no real attempt to reconcile it with the elasticity approach. Even Haberler, in one of the most closely reasoned expositions of the subject[10] assumes that "we have constructed a sort of average or aggregate curve; in other words we have demand and supply curves for a 'representative bale' of imports and exports" (p. 196). Most other writers do not discuss this aspect of the problem at all.

So far as I can see there is no way out of the difficulty. Any calculation of elasticities for a group of nonhomogeneous goods must measure the relationship between some sort of price index and some sort of index of quantity. No index number can take account of the entry of new goods into trade, or the disappearance of goods formerly traded, and whenever there are changes in the relative importance of different goods, there can be no uniquely right system of weighting. Yet these changes are the very essence of the international adjustment mechanism.

The elasticity of demand for a homogeneous good can be defined in terms of price and quantity which are independent of the statistical techniques used to estimate the elasticity. It is thus possible to conceive of a "true" elasticity and of various more or less close approximations to the truth given by different methods of estimation. With a group of nonhomogeneous goods, however, it is impossible to define elasticity except in terms of the particular methods of estimation which may be used. When we have the type of changes which are bound to occur in the course of international adjustment, none of these methods is uniquely right, and we cannot conceive of a true elasticity. When we use the words elasticity of demand (or supply) for imports (or exports) we quite literally do not know what we are talking about.

We can, of course, make the whole vexatious difficulty fly out of the

[10] G. Haberler, "The Market for Foreign Exchange and the Stability of the Balance of Payments," *Kyklos*, 1949, III (3), 193-218

window by constructing a simple model in which we assume only two traded goods, one homogeneous import and one homogeneous export. This procedure is of very limited usefulness. It rules out an essential part of the adjustment mechanism of the real world; the construction of the model itself presents some peculiar theoretical problems; and if it is simplified sufficiently to avoid these problems, it can be handled more easily and effectively by an analysis of stability conditions on the lines developed by Hicks than by the use of elasticities.[11] Nevertheless, a brief glance at such a model may be helpful.

First, suppose that we have only two goods, that they are both produced in each of two countries but also traded, and that trade proceeds by means of barter. It would, of course, be impossible for an actual adverse balance to arise. A potentially adverse balance would take the form of an excess of demand for oversupply of the imported good at the ruling market price, and this would tend to raise the price of the import in terms of the export good. This change would set up income, substitution and production effects. The substitution effect would cause a shift in demand in both countries away from the good which had risen in price, while the production effect would stimulate an increase of the supply of that good in both countries. Both these tendencies must be equilibrating, and only the income effect will be ambiguous in direction. The country which has suffered a deterioration in its terms of trade may be expected to consume less of the good in question as a result of its lower real income, while the country whose terms of trade have improved may be expected to consume more. Normally the two influences will tend to cancel one another out, but they would not do so if the good which rose in price were an inferior one for the citizens of one country, but not for those of the other. We thus reach the standard conclusion which applies to a similar situation in a single country; the markets will be stable unless there are very strong and perverse income effects. Since we have excluded money, we cannot have a balance-of-payments problem in this model. But one significant point arises: the correction of a potentially adverse balance involves, of necessity, a deterioration in the terms of trade.

We now introduce into our system what Hicks has called a "shadow money," a money which acts as a *numéraire* but which has none of the other characteristics of money and, in particular, cannot be hoarded. We suppose both our countries to have such a shadow money. There would seem to be nothing to determine the absolute level of prices, and an adjustment might take place either through the exchange market or through a change in goods prices. It can be shown, however, that so long as money can be used only for the immediate purchase of goods,

[11] J. R. Hicks, *Value and Capital* (Oxford, 1939), Pt. 1.

it is impossible to have an unstable exchange market associated with stable commodity markets.

To illustrate this, it is convenient to get rid of the production effect, which is bound to be equilibrating. We therefore assume two countries, A and B, each completely specialized on goods α and β, respectively, and having currencies *a* and *b*. Suppose that country A has a tendency to an adverse balance, and that the whole adjustment takes place in the exchange market, the domestic prices of each good in the country producing it being held constant. Constant domestic prices mark the situation in which, according to the elasticities formula, the demand elasticities have to be highest in order to insure stability.

A fall in the *a-b* exchange rate will make good β dearer in A, and so reduce the volume of imports and the demand for currency *b*. The exchange market will thus be stable unless the demand for the good α in B is so inelastic that the fall in its price there reduces the supply of currency *b* to an extent even greater than the reduction in the demand for it. But if money can be used only for the immediate purchase of goods, a reduction of the supply of *b* in the exchange market implies that the citizens of B must be spending correspondingly more of their own currency on their own commodity. Hence if the supply of currency *b* is reduced by more than its demand, it follows that the demand for good β from citizens of B increases by more than its demand from citizens of A decreases. The rise in the relative price of good β, brought about by depreciation, has increased the excess demand for it, and the market for the two goods, in the two countries together, is in unstable equilibrium.

The assumption of a shadow money has only a very limited usefulness, yet the transition from a shadow money to a real money is by no means without its difficulties. An essential characteristic of real money is that it can be hoarded, and changes in the propensity to hoard will involve changes in aggregate money income.[12] It thus appears self-contradictory even to set up a model involving a real money which does not take account of fluctuations in income. Fluctuations in domestic income are, of course, bound to occur when an actual change in the trade balance takes place, unless that change is offset by an equal and opposite change in some other component of national expenditure, and this has been realized from the beginning by exponents of the elasticity approach.

[12] Fluctuations in aggregate money income will be associated with fluctuations in real output if they occur at less than "full employment level" and with increases or decreases in inflationary pressure if they occur at above that level. Most writers have assumed idle resources and concentrated on the real fluctuations, but here it seems better to adopt the more general formulation.

The treatment of these fluctuations has given rise to some differences of opinion. Mrs. Robinson[13] regards them as purely a consequence of changes in the foreign balance, and so contends that they can be ignored in considering the direction, though not in considering the extent, of the change which depreciation will cause. Harberger, on the other hand, demonstrates that a change in real output would occur in his model, even if there were no change in the foreign balance, if depreciation led either to a change in investment or to a change in the propensity to hoard.[14] For his model, which assumes constant prices, Harberger finds that the critical value for the sum of the two demand elasticities is not unity, but one plus the sum of the two marginal propensities to import.

The existence of income fluctuations does not necessarily prove fatal to the elasticities approach. Both Harberger and Stuvel[15] have produced elegant and relatively simple mathematical systems which incorporate income fluctuations into the analysis. Both, however, depend upon the existence of marginal propensities to import which are stable enough to be used as parameters. To test the validity of this assumption we need to ask two further questions. Will the price changes resulting from depreciation create changes in the structure of the economy which are likely to alter the relationship between "real income" and imports? And will the changes in imports and exports resulting from a change in income themselves set up further price changes independent of the initial ones? The use of marginal propensities to import in conjunction with elasticities is only justified if both these questions can be answered in the negative, whereas I suggest that the answers to both should be in the affirmative.

We have already suggested that the essence of the adjustment mechanism is a change in relative factor prices leading to a change in the relative importance of different goods in the import and export lists. It would be very surprising if goods which entered into or disappeared from trade responded to changes in income in just the same way as others, and if goods which diminished in importance responded in just the same way as those which increased in importance. Import lists will be different after depreciation from what they were before, and it is only to be expected that they should respond differently to changes in real income.

Moreover, the process of adjustment outlined above involves changes in the relative prices of factors, *i.e.*, a redistribution of income, in both countries, and it is unlikely that the marginal propensity to import

[13] "The Foreign Exchanges," *op. cit.*, pp. 183-209.

[14] A. C. Harberger, "Currency Depreciation, Income and the Balance of Trade," *Jour. Pol. Econ.*, Feb. 1950, LVIII, 47-60.

[15] G. Stuvel, *The Exchange Stability Problem* (Oxford, 1951).

would remain just the same after such a redistribution as it was before.

The changes in factor prices will change both the position and the shape of the cost curves (in each country's own currency) of the domestic industries which compete with imports. This will mean that these industries will react differently from before to changes in demand associated with income changes. Unless we confine ourselves to the assumption of constant domestic prices, we have to consider the secondary price changes (as between imports and domestic goods) which arise from changes in demand which are, themselves, consequences of changes in real income, and these secondary price changes will be different after depreciation from what they would have been before.

Finally, changes in relative factor prices will change the import content of exports. The marginal propensity to import of one country is reflected in the exports of another, and changes in income and imports will therefore be reflected back from one country to another in a different way after depreciation.

I suggest, therefore, that the use of ordinary marginal propensities to import in this context is a simplification which is very likely to be misleading. I do not doubt that a formal solution of these problems could be obtained by constructing a much more elaborate model with a sufficient number of new propensities and elasticities, but the model would probably produce so many equations that an electronic calculator would be needed to solve them. Even then, I suspect, it would only tell us that everything depended on everything else.

So far we have been concerned with two objections to the elasticity approach; that it is impossible to define elasticities which take account of the changes in the composition of import and export lists, which are the essence of the adjustment mechanism; and that it is very difficult, if not impossible, to take adequate account of the changes in income which are bound to be associated with depreciation. A third and final objection is that depreciation is likely to lead to shifts in supply and demand curves, independent of those which may occur through changes in income, as a result of changes in the relative prices of imports, exports and nontraded goods.[16]

To illustrate these effects, suppose that a country, which we call A, increases its exports of motorcars to another country, B, as a result of depreciation. There will be a decrease in the demand for "motor-making" factors in B, and this will reduce their relative price, and cause a shift to the right in the supply schedules of other B goods

[16] This point has been made by R. F. Kahn, "Tariffs and the Terms of Trade" in *Rev. Econ. Stud.*, 1947-48, XV (1), pp. 14-19; and C. Kennedy, "Devaluation and the Terms of Trade," *ibid.*, 1949-50, XVIII (1), pp. 28-41.

which use the same sort of factors as the motor industry. This shift to the right in the total supply schedules for such goods is likely to be associated with a shift to the right in the export supply schedules of those of them which are exported. It is also likely to lead to a fall in the domestic prices of these goods, whether exported or not, and this in turn will lead to a shift in the B demand curves for imports. Where the income effect of such a change predominates there will be a shift to the right in the demand curve for imports and when the substitution effect predominates, there will be a shift to the left in the demand curve for imports. Thus the increase in the volume of A exports as a result of depreciation will cause shifts in both the demand curve for imports and the supply curve for exports in country B. Similar changes in factor prices, though in the opposite direction, will be set afoot in country A, so that the position of all four curves will be affected. Only if all these shifts are so small as to be negligible, will the true elasticities of supply and demand be relevant to the situation created by depreciation. While this might be so for a country whose foreign trade forms only a very small proportion of its national income, it is very unlikely to be so for a country such as Great Britain.

It may be said that the whole of our criticism of the elasticity formulae boils down to the statement that they depend on a number of simplifying assumptions, and that a similar accusation could be made against almost any proposition in economic theory. But the vital question in the application of theory to policy is whether the things which have been left out in the process of simplification are important or unimportant. Indeed a large part of the art of political economy lies in knowing what to ignore. In this case, if one accepts the factor-proportions analysis on which the pure theory of foreign trade depends, it seems that the simplifications required in order to validate the elasticity formulae are of the utmost importance, and that policy conclusions based on the formulae are far more likely to be wrong than right.

Up to now the argument of this paper has been purely negative, but it would be unfair to urge the rejection of the elasticity approach without at least trying to put something in its place. The simple theoretical apparatus, which is all I have at my command, cannot reach the same precision as appeared to have been reached in the elasticity formulae, but I think it can say a little which is of use as a general guide to policy. We can use the results which emerged from our simple models as a starting point. In these models, we found that, so long as money can be used only for the immediate purchase of goods, it is impossible to conceive of an unstable exchange market unless the market for at least one of the traded goods is also in unstable equilibrium. We also found that

if the goods markets are stable, depreciation, carried to a sufficient extent, must be capable of restoring the trade balance, though at the cost of a deterioration in the terms of trade.

For the present we concentrate on the trade balance, though it will be suggested that our theory also has relevance to the broader problem of the balance of payments. We first distinguish between the various circumstances which may cause the balance of trade to become unfavorable. For this purpose we need criteria of external and internal balance, and it is convenient to start from a point of "full employment." We define full employment as the level of employment which will maximize home-produced national income at constant prices, the value added by the setting to work of a marginal man from among the unemployed being just offset by the loss of value resulting from the frictions and dislocations of "overfull employment." The relationship between income and expenditure must obviously be an *ex-ante* one, and I take as my criteria of equilibrium that planned expenditure (public and private, for consumption and investment) on domestic goods and services plus expected sales abroad should equal the value, at current prices, of full-employment output; and that planned expenditure on foreign goods and services should equal expected sales abroad. If these plans and expectations were fulfilled, they would result in the maintenance of full employment and a neutral trade balance. We shall confine ourselves to the short period, so that we need not concern ourselves with the secular growth of full-employment output. Also, purely in order to simplify the exposition, we shall speak of two countries only, though these can be interpreted as "home" and "the rest of the world."

We can now distinguish five types of departure from equilibrium which may be, and at times have been, of great practical importance: (a) Where expected sales abroad cannot be made because international prices are out of line; (b) Where expected sales abroad cannot be made because of a fall in the foreign demand for one or more export goods; (c) Where there is inflation at home; (d) Where there is depression abroad; (e) Where there is stability in internal expenditure and a neutral trade balance, but with large idle resources. It is proposed to glance at each of these situations in turn.

Situation (a). We suppose that the home country is enjoying full employment, and is in *ex-ante* equilibrium in the sense described above, but that prices are such that expected sales abroad cannot be made. There will thus be a debit balance in the international account, total expenditure on domestic products will fall below the current value of full employment output, goods will remain unsold, and unemployment will appear. This primary fall in employment would tend to set up a

multiplier effect, leading to secondary falls in employment and in home-produced national income; the reduction of national income would tend to reduce the demand for imports and (together with the opposite effect in the foreign country) would tend to restore the trade balance. Normally, however, these income effects will not be sufficient fully to restore equilibrium.

We now suppose that the monetary authorities of the home country allow its currency to depreciate to the point (if such a point exists) which would restore the trade balance with a full-employment level of real income. As exports increase and domestic spending is diverted from imports to home-produced goods, national income will rise again. The income effect mentioned above, though it will continue to operate in an equilibrating direction so long as it exists, will grow progressively weaker and finally, with a return to full employment, will disappear. The problem is, therefore, whether there is a new exchange rate lower than the old which will maintain equilibrium in the trade balance when the old level of home-produced real income is restored.

Here the reasoning of our simple model of pages 285-86 can be of use. If the monetary authorities both of the home and the foreign country were to take steps to maintain the total money expenditure of their citizens at the level at which it was running before the departure from equilibrium (*i.e.*, equal to the value at current prices of full-employment output) we reproduce artificially the essential condition of our simple model. A decrease in expenditure in one sector of the economy must have its counterpart in an equal increase in expenditure somewhere else, just as it would if money could only be used, as in our simple model, for the immediate purchase of goods. In particular, any decrease in expenditure on foreign currency in the exchange market must be associated with an equal increase in expenditure on domestic products.

The impact effect of depreciation will be a cheapening of home goods in terms of foreign ones, a reduction in the volume of imports and a reduction in the demand for foreign currency. The exchange market will be stable unless this reduction in demand is associated with an even greater reduction in supply. But a reduction in the supply of foreign currency in the exchange market must mean that foreigners are spending more on their own products. This increased expenditure would be diffused over a great variety of products, and there might be most complicated substitutions between one and another, but it still remains true that there must be at least one good for which the increase in foreign demand is greater than the reduction in demand from the home country. In other words, there must be at least one good for which an increase in relative price would increase excess demand. We

thus reach the conclusion that a sufficient measure of depreciation must be effective in restoring the trade balance unless at least one of the product markets is in unstable equilibrium.

This conclusion is independent of whether traded goods are produced in both countries or not, and its validity does not depend on the assumption of constant prices made in our simple model. If depreciation produced a secondary rise in the domestic price of the home product, this would mitigate any fall that might occur in the supply of the foreign currency (since a fall can only occur if foreigners spend less on imports the lower the price) but it would in no way alter the fact that, if such a fall does occur, it must be associated with an increase in foreigners' spending on their own products. If there is a secondary fall in the price of the foreign products, it follows a fortiori that an increase in total expenditure on them must produce an increase in excess demand.

The same conclusion must obviously hold, if money expenditures are not maintained at a constant level, so long as expenditure in the home country does not increase and that in the foreign country does not fall below its equilibrium level as a result of depreciation. There is no obvious reason why foreign expenditure should fall below its equilibrium level,[17] but that of the home country might rise above it if depreciation brought claims for increased wages or if there were induced investment. It would, therefore, be necessary for the monetary authorities of the home country to prevent money expenditure from rising above its equilibrium level, and for the trade unions to refrain from pressing claims for wage increases which would make it impossible to regain full employment with this level of expenditure. On the other hand, the government could safely take the steps to offset any reduction in money expenditure and mop up any idle resources which might appear during the transition period.

This analysis is more general than the elasticity formula, for it can be applied to the whole foreign account. As long as the markets for services and assets, as well as goods, are stable, and as long as expenditure on all items and not merely on goods, is held constant, depreciation must correct not only the trade balance but the balance of payments as a whole.

How much importance we attach to this conclusion depends on how much confidence we have in the stability of the markets concerned. Experience affords very strong grounds for believing that the markets for services and for most forms of goods are stable. Economic analysis

[17] The unfavorable balance for the home country would be a favorable balance for the foreign country, and would tend to raise its income above the equilibrium level; the elimination of the balance by devaluation would thus only reduce foreign income to its equilibrium level.

and policy are both based on this assumption, and if we regulate our internal affairs satisfactorily on the assumption that we are dealing with stable markets, it seems only reasonable to make the same assumption in framing international policies.

On the other hand, the markets for commodities with low storage costs, real estate, stocks and shares, and currencies for hoarding are subject to periods of speculative instability, though these periods are generally brief. It is, therefore, quite possible that depreciation may set up price expectations in some of these markets which will lead to a period of instability, and if the latter is sufficiently strong, it may lead to instability in the exchange market as a whole. This is a strong argument against completely free exchanges, and in favor of an exchange equalization account which can be used to combat speculation. In my judgment, however, it does not seriously reduce the likelihood that, in the situation outlined above, an appropriate amount of depreciation will ultimately serve its purpose.

We can now dispose comparatively briefly of the other situations outlined above.

Situation (b). In this situation we suppose the same *ex-ante* equilibrium as in (*a*) but that the trouble with the trade balance arises not from general prices, but from a fall in the foreign demand for a particular export. This may be supposed to arise either from a change in tastes, from a change in foreign techniques which robs an export industry of its comparative advantage, or from the imposition or raising of a foreign tariff. The income effect will be as in situation (*a*) but there will also be a fall in the relative price of the export good concerned, which will have secondary repercussions on the whole structure of prices. Again, however, the maintenance of total money expenditure at an equilibrium level together with an appropriate amount of depreciation will restore the balance as long as the goods markets are stable.

Situation (c). This situation is very different from either of the two previously discussed. Here we suppose that planned expenditure on domestic goods plus expected sales abroad exceeds the current value of full-employment output. If domestic plans are carried out, expected sales to foreigners cannot be realized, not for lack of demand but because the goods will not be there to sell. If depreciation did succeed in luring some goods from the home to the foreign market, the only result would be that domestic plans would become incapable of fulfilment, and the attempt to fulfill them could only drive up prices, thus tending to nullify the effects of depreciation. The only way to cure this situation is to bring about a reduction in domestic spending plans; any revision of these plans which resulted from depreciation would be more likely to be in an upward than a downward direction, and

depreciation in these circumstances would be worse than useless.

Situation (d). In this situation we suppose that the home country starts from a position of equilibrium as in (*a*), but that sales fall short of expectations because of a fall in employment and incomes abroad. This will produce domestic income effects as in (*a*), but the situation will be more complicated because any reduction in the home demand for imports will be "reflected back" through a further fall in foreign income and in the foreign demand for exports. There would be a similar disequilibrating effect associated with depreciation. So far as depreciation reduces the home demand for imports or pushes exports in substitution for foreign produced goods, it will depress foreign income and bring about a secondary reduction in the foreign demand for exports. The full analysis of this situation is very complicated. It is clear, however, that (since we can no longer assume that foreign expenditure is maintained at the equilibrium level) the argument applied to situations (*a*) and (*b*) is not valid here. It is by no means certain that there is any exchange rate which will restore the balance of payments consistently with the maintenance of full employment at home. Even if such a rate does exist, depreciation will do its work only at the expense of complicating the stabilization program, of the foreign country.

Depreciation does not seem an appropriate remedy here. The best policy is clearly for the government to offset the fall in exports by creating additional spending at home (thus maintaining equality between actual spending and the value of full-employment output) and to meet the resulting foreign deficit from reserves. This is what reserves are for, and a country with adequate reserves should be willing to see them drawn on heavily in such a situation. If reserves are so small as to make some restriction of imports essential, then it would be better to bring it about directly than to rely on the uncertain working of depreciation.

Situation (e). This is Mrs. Robinson's "beggar-my-neighbor" case. One way of posing this is, "will depreciation turn a neutral balance into a favorable one on the assumption that there are no changes in spending except those following from the act of depreciation itself?" If we assume, with Mrs. Robinson, that depreciation will affect total domestic spending and home-produced real income only through changes in the trade balance, then the reasoning of (*a*) will apply, and we should expect depreciation to produce a favorable balance. If we take account, with Harberger, of the changes which are likely to be set afoot independently of changes in the balance, then the argument does not apply, and there is no certainty about the result. In any case, the creation of such a balance would set up income effects inimical to it, so that the extent of the movement would be unlikely to be large.

A slightly different way of posing the problem is to suppose that both countries have idle resources, and to ask whether depreciation would make it possible to sustain a controlled increase in domestic expenditure (unmatched by any similar increase abroad) without producing an adverse balance. Since depreciation with constant expenditure has been shown to improve the balance, there is presumably some increase in expenditure which could be sustained, consistently with the maintenance of a neutral balance, with an appropriate amount of depreciation. This would not, of course, have any deflationary effect on the foreign country.

To sum up, the first and negative part of this paper tried to show that the theory of flexible exchanges is not a good subject for analysis in terms of elasticities and marginal propensities; the number of variables is too large and the functional relationships too complicated. It has only been handled in this way with tolerable simplicity by constructing models which leave out essential features of the adjustment mechanism, and the attempt to draw policy conclusions from such models is bound to be misleading.

The second part of the paper attempts to make some generalizations based on the pure theory of foreign trade, and which might reasonably be expected to apply to real world conditions. The theory lacks the precision of the elasticity formulae, and I have no doubt that, in subtler hands than mine, it is capable of a great deal of refinement. It is, therefore, advanced only very tentatively. I feel, however, that it does at least tell us when depreciation is, and when it is not, likely to be useful. It will not cure the balance-of-payments problems attendant on domestic inflation; it is not likely to help much in mitigating the effects of a foreign depression; and it will be of very limited usefulness as a purely beggar-my-neighbor remedy. On the other hand, when used in conjunction with a controlled increase in domestic expenditure, depreciation may help in the escape from a position of underemployment equilibrium. The chief usefulness of flexible exchanges is, however, when both the countries concerned are enjoying a high level of domestic employment, but without inflation. It is here that our conclusions differ radically from those of the elasticity approach, for our analysis has shown that—on assumptions which are by no means beyond the powers of a sensible monetary and fiscal policy—depreciation is bound to cure an adverse balance. It would thus appear that we have underestimated the flexibility of the international economic system. The path to free convertibility, multilateral clearing and the removal of quantitative restrictions will certainly not be smooth, but it need not be the impassable jungle which we have sometimes been led to expect.

OBSOLESCENCE AND TECHNOLOGICAL CHANGE IN A MATURING ECONOMY

By MARVIN FRANKEL*

It is a frequently asserted proposition in economic literature that older, industrialized countries such as Britain suffer a disadvantage relative to newer, industrializing countries. More generally, it is argued that both individual industries and entire economies, once they have reached an advanced state of development, experience difficulty in assimilating later and more modern techniques. The time comes, in the words of Veblen, when installations, having been "placed and constructed to meet the exigencies of what is now in a degree an obsolete state of the industrial arts," and having changed little since their origin, "are, all and several, 'irrelevant, incompetent and impertinent' in the same degree in which the technological scheme has shifted from what it was when these appliances were installed."[1] As a result, costs are higher and productivity lower than they ideally ought to be, and plant and equipment are old and inefficient.

A variety of hypotheses has been advanced in further explanation of this state of affairs. They may be grouped conveniently, if roughly, into three categories: those which stress institutional rigidities; those based upon resource inadequacies; and those emphasizing the effects of sunk costs. For shorthand purposes, let us term these categories respectively the institutional, the environmental and the technological.

In the first category belong such common factors as labor resistance to technical change, entrepreneurial provincialism, lack of knowledge, immobilities of labor and money capital, and more generally, archaic modes of thought and patterns of action. These, it has been said, mature and strengthen as an industry or country advances industrially, so inhibiting innovation and modernization adjustments.[2]

In the second category, termed environmental, should be put those

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[1] Thorstein Veblen, writing on Britain in *Imperial Germany and the Industrial Revolution* (London, 1915), Ch. IV, "The Case of England," p. 127.

[2] In this category belongs a substantial part of Veblen's explanation, which runs in terms of "custom, wont and usage," for British backwardness. See *ibid.*, Ch. 2-4. Here too should be put what George W Terborgh has called "a failure of *reequipment* policy"

hypotheses which posit as the cause of retardation the presence of limitational elements—limited supplies of land or other resources. So-called modern methods may require that certain factors be used in quantities or ratios that are uneconomic for some industries and areas. Thus a country which, at the inception of its industrialization is plentifully endowed with the resources necessary to modern production methods, may subsequently find that some of those resources have become scarce and expensive. Or it may find that a changing technology requires new resources that are in short supply. In either case it will adapt only haltingly and with difficulty to the new ways.[3]

It is with the third or technological category, which embraces effects attributable to sunk costs, that this paper will deal. The relevant hypothesis can be stated as follows: As an industry (or industrial economy) grows and adapts to changing and increasingly complex production methods, interconnections, more or less rigid, develop among its technological components—among machines, plant, transport network and raw material supplies—that make increasingly difficult the introduction into the system of new, cost-saving changes. It may then happen that the entire system becomes obsolete because, as Veblen has observed, "An adequate remedy by detail innovation is not always practicable; indeed, in the more serious conjunctures of the kind it is virtually impossible, in that new items of equipment are necessarily required to conform to the specifications already governing the old."[4] Unable to utilize the new production methods, the industry continues with its old ones. As a result, its costs are higher and labor productivity lower than they would be in a less "mature" industry. The old industry finds itself penalized for having taken the lead and shown the way to its young competitors in other regions.

This view seems to contradict that implicit in orthodox cost-price theory, according to which the rational entrepreneur or manager will introduce a cost-saving method either immediately or at some later date

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lack of an adequate technique for analyzing the replaceability of equipment ". . . Britain knew how to build great industries but never learned how to rebuild them" "Capitalism and Innovation," *Am. Econ. Rev.*, Proceedings, May 1950, XL, 122.

[3] Under this heading, in addition to explanations resting directly on absolute or relative resource shortages, fall explanations based on logistic theories of growth and, in part, those involving a frontier thesis. Implicit in the logistic function is the notion of a factor or factors in short supply that exert increasing resistance to growth; while the frontier thesis is premised upon a plentiful land supply, development and settlement of which profoundly condition production methods and other institutions. At times the dividing line between the institutional and environmental categories may be quite vague. The frontier thesis straddles both categories; and shortage of resources, whether human or natural, can result from artificial as well as natural barriers.

[4] Veblen, *op. cit.*, pp. 125-26. Veblen's discussion of British backwardness runs in terms of both the technological and the institutional.

when the old plant and equipment wear out. Under this latter view, and barring the presence of institutional or environmental factors, the old industry is as free as the newcomer to adjust to the changing times.[5]

The paragraphs that follow inquire into the technological explanation of backwardness and attempt, through reference to conventional cost-price theory, to define the conditions governing its validity. The implications of those conditions for a maturing industrial economy are then explored. Finally, some observations are offered on the extent to which the conditions prevail in practice.

I. *Innovation Criteria*

At the outset it is necessary to distinguish between method innovation, a change in the technique for producing a given product, and product innovation, a change in product type or quality. Because abstraction from the complicating effects of product innovation will simplify analysis of our central problem, our discussion relates mainly to method innovation.

The analysis requires use of two cost categories: past or sunk outlays, and future outlays. Past outlays denote expenditures already made which are allocable to some future production period and which must be recovered from future revenues. The undepreciated portion of costs sunk in capital equipment is the principal type of such outlays, and the only type our analysis will explicitly treat.[6]

Future outlays denote all costs that will be incurred over some future production period: costs for labor, raw materials, inventories, repair and maintenance, etc. Also included are outlays for replacement of capital equipment or for new capital equipment which have not yet been made but which must be made over the coming years.

The total costs of any production method are represented by the sum of the past and future unit outlays associated with its use. For an old method already in use, past outlays always are some positive amount unless the cost of equipment has been completely written off For a new method not yet adopted, past or sunk outlays are zero, and total costs are represented by future outlays.

Let us limit consideration to assets of the one-horse-shay variety.

[5] For a statement of this view see F. R J. Jervis, "The Handicap of Britain's Early Start," *The Manchester School*, Jan 1947, XVI, 116, 118.

[6] Some fraction of past outlays for research, training programs and advertising also fall into this classification Strictly speaking, outlays for raw materials and inventories already in hand also are past outlays But here the interval of prepayment is relatively short—usually less than a year—and the sums involved are not sunk in specialized equipment but are more readily recoverable For these reasons it is more convenient to consider raw material and inventory costs as current operating costs and to treat them as if they were future outlays.

Let us further define the production period to which costs and revenues are allocated as the remaining useable life of the capital equipment of the old production method.

Given these definitions and conditions, the criteria governing whether and when to introduce a new production method are, in principle, clear enough. A change should be made only if it will result in an increase in total profit. In making the comparison between old and new methods—and neglecting the effects of taxes—the sunk outlays of the old method have no relevance; only future outlays need be taken into account. This is so because costs which are sunk continue and require payment regardless of whether the new method is adopted.[7] If total profit from the new method—the excess of total revenue over total cost—exceeds total revenue less future costs of the old method, then the old method should immediately be replaced. If, on the other hand, total profit from the new method falls short of revenue less future costs of the old method but exceeds revenue less total costs of the latter, then the old method should be continued in use until the fixed plant is worn out.[8]

These criteria apply whether a firm is young or old, whether it is in a competitive or monopolistic market situation, and whether it is publicly or privately owned.[9] Two further points are worth noting.

[7] If payments, whether to stockholders or bondholders, are defaulted, then for purposes of innovation decisions the case may be treated as if the equipment were fully amortized, *i.e.*, sunk costs are zero. To the extent that the equipment has a positive scrap value, its cost may be treated as an addition to the future outlays of the old method or a deduction from the future (total) outlays of the new method. In the extreme case where the scrap value equals the unamortized balance, that entire balance may be treated in this way.

[8] In comparing the two methods, the optimum period of use for each must be determined. Under the specified assumptions, this period for the old method is the remaining useable life of its fixed capital, while for the new method it is the durability of the new fixed capital The periods of both must then be adjusted to the same time base and all magnitudes reduced to present values It seems desirable also to make the comparison when each method produces at its optimum rate of output. With these points in mind, the propositions in the text are readily demonstrated

Let $P =$ past outlays of the old method
$F =$ future outlays of the old method
$F + P =$ total costs of the old method
$T =$ total costs of the new method
$R_1 =$ total revenue from the old method
$R_2 =$ total revenue from the new method

Adoption of the new method will not eliminate P since these costs are sunk and continue regardless of the method used. Hence only if $(R_2 - T) > (R_1 - F)$—the criterion for immediate replacement—is $[R_2 - (T + P)] > [R_1 - (F + P)]$. If $[R_1 - (F + P)] < (R_2 - T) < (R_1 - F)$, then when the equipment wears out $(R_2 - T) > (R_1 - F)$. This is so because at this point F is augmented by replacement costs.

[9] Our simplified formulation—assumptions and criteria—will suffice to elucidate the problem at hand; it is not designed to explore the many complications which may arise in making replacement—innovation decisions. For a discussion of replacement criteria under more complex and more customary conditions, see George Terborgh, *Dynamic Equipment Policy* (New York, 1949), especially Chapters II, V, VI, and XI.

First, the new firm will utilize the latest, cheapest method when it commences operations and as it expands, and its rate of expansion is apt to be more rapid than that of the old firm. This method, if its profits fall short of the excess of revenue over future costs for the older method, will be one which replacement criteria deny to the old firm until such time as it must replace its equipment. Second, in the absence of factors making for an increase in demand, and other things being equal, a new method will be introduced sooner in a competitive than in a monopolized industry.[10] In the former, entry of new firms and expansion by old ones will result in an immediate introduction of the new method no matter how slight the cost-saving, and prices will tend to fall to the extent that cost-savings permit. In the latter, unless profits from the new method exceed the excess of revenue over future costs for the old method, there will be little tendency to change until the old equipment is worn out.[11]

In this orthodox cost-price approach to the problem and, to repeat, abstracting from institutional and environmental factors, it appears that both old and new firms will employ the latest and cheapest method available at the time of investment commitments. This may mean that a more modern method with lower total costs will be used by the new firm. The differences in method and in cost, regarded by some as an indication of retardation or backwardness on the part of the old firm, may persist for a period measured by the remaining usable life of the old equipment.[12] But then replacement will take place. If, by this time, further technical advances have occurred, the old firm should be even more modern than its rival.

During the interim when cost and equipment differences exist, the old firm, if it has not correctly estimated its obsolescence rate, will face a financial burden in the form of some fraction of the unamortized balance on its equipment. Investors will suffer accordingly, for such is the penalty for faulty (normal?) foresight. But the burden will have no counterpart in terms of current real resource costs. *Individual* investors may calculate that they would have been better off never to have

[10] Other things may not always be equal. Schumpeter has stressed conditions frequently present in monopoly and absent in competition which conduce to rapid technological progress. See his *Capitalism, Socialism and Democracy* (New York, 1947), Chs. VII and VIII.

[11] For an analysis of innovation under various market structures, see William Fellner, "The Influence of Market Structure on Technological Progress," *Quart. Jour. Econ.*, Nov., 1951, LXV, 556-77.

[12] Our discussion of innovation criteria was introduced with the one-horse-shay assumption. It is, of course, conceivable that through appropriate maintenance expenditures equipment can be kept in use indefinitely. However, in practice one of two things is likely to happen: (1) Variable costs will rise as the equipment ages and replacement with the new method will become profitable; or (2) continued technological advances will eventually make introduction of the new method profitable.

taken the initial gamble. But the *community* cannot for that reason regret the addition to its capital stock and the income generated by it. Unlike the private investor, it would not necessarily be better off if the investment had been postponed. On the contrary, the community might justifiably consider itself fortunate to possess, in its old equipment, an economizing production alternative not open to its young competitor.

II. *Application of Criteria to an Interrelated Technology*

Where, if at all, in the foregoing scheme of things can a counterpart be found for Veblen's retardation thesis? Or if, in order to find support for his views, one must depart from that scheme, then with which of its assumptions must one dispense?

Veblen's conception of technology is an organic one which views the structural and functional aspects of the production process as closely interrelated. As a firm, industry or country develops and its technology becomes more intricate, interconnections proliferate which limit sharply the range of new methods it can assimilate. Not all new techniques can be utilized, but only those which can, in some sense, conform to the past. Unlike the young enterprise or newly industrializing country which is, technologically, a *tabula rasa* without any system whose contours demand conformity, modernization for the established enterprise or country is limited by the extent to which the necessary changes can be made to "fit" the existing system.

This view of things contrasts with the traditional one of the technological unit as divisible, the capital components of the production process, such as tools, machines and plants being regarded as self-contained and individually replaceable, with each item subject to separate costing and amortization. Here the technological unit relevant for a replacement or innovation decision is relatively small, whereas in the other case it is relatively large.

Where the technological unit is large, as Veblen implies it generally is, modernization may not take place as readily as when it is small. Let us visualize a simplified production process consisting, on the technical side, of a plant which includes a series of different machines each designed to perform a necessary operation. In addition certain quantities of labor and raw materials are required. Let the plant comprise past outlays and the labor and raw materials future outlays.

If now a new machine is developed, then on conventional suppositions about technology and depending upon the degree of profitability of the new machine, two alternatives are possible: Either the old machine will be replaced immediately with the new one or it will be continued in use until it no longer is serviceable. Where technological interconnections exist, however, it may prove impossible to fit the new machine into

the prevailing pattern of operations. It might be too large for the available plant space, or too heavy for present flooring, or impossible to adapt for the continuous feeding mechanism that served the other machines, or unsuited to processing the semifabricated product in the precise way required for subsequent operations. It might be the case, that is to say, that the new machine could not be introduced unless the entire production sequence or a large fraction of it were replaced.

Confronted with this situation, the enterprise would compare the new and old methods not on a component or machine basis but on an entire plant basis since only by replacing existing plant in toto could it utilize the new machine. Even if, on the machine basis, profits from the new method exceeded revenue less future cost of the old method, comparison on an entire plant basis probably would find profits from the new method below revenue less future costs of the old method; rarely would the gains resulting from improvements in a single machine suffice to warrant immediate replacement of the entire plant.[13]

The situation is one which calls for a delay in replacement until the existing plant wears out. Unfortunately, however, it is highly probable that the durability of each of the several machines will differ. To replace a worn-out component of the old plant with one that fits the specifications of the new would require the discard of other components of the old plant which still were quite serviceable. On the other hand, to replace the worn-out component with a duplicate of itself would entail continued use of the older method; unless several or all of the components wore out simultaneously at a later date, the cycle would repeat itself. In these circumstances, modernization would be indefinitely postponed.

At this juncture two questions arise. First, what are the implications for unit costs of an interrelated technology? If an old production method is continued in use when, in absence of interrelatedness, it would have been replaced, then costs will tend to be higher than they otherwise would be. How much higher will they tend to be? Second—really a prior question—what are the conditions, aside from the fact of interrelatedness, which determine how much higher unit costs will be?

Mathematical formalization of our problem, as developed in Part I of the appendix, points to six determining variables. They are:

- t, the number of components in the old method that are linked together, or the degree of interrelatedness;
- r, the discount rate;
- nt, the durability of capital (assumed the same for both methods);
- k, the ratio of total variable to total fixed costs of the old method;

[13] Except as noted in a few places, it is of no particular consequence to the discussion whether innovation affects but a single component or affects several or all of them.

h, the ratio of the fixed costs of the new to the fixed costs of the old method;

$-1/\alpha = E$, the elasticity of demand (always negative but treated in the text without regard to sign).

For any set of values assigned these variables, it is possible to determine by how much average total unit costs of the new method can fall short of average total unit costs of the old method and still leave the enterprise content with the old method. Table I shows the outcome in a number of specific instances. To illustrate with row 4, if there are 2 components, the discount rate is 5 per cent, the durability of capital 30 years, the ratio of total variable to total fixed costs 4 to 1, new capital costs are equal to old capital costs, and the elasticity of demand is 6, then the enterprise will continue with the old method as long as total unit costs of the new method do not fall below 80.1 per cent of those of the old method.

In rows 2 through 7 of the table and again in rows 9 through 14 the values assigned each of the variables are changed once. By compar-

TABLE I.—MINIMUM UNIT COST RATIO COMPATIBLE WITH USE OF OLD METHOD[a]

	Number of Components	Discount Rate	Durability of Capital (years)	Ratio of Variable to Fixed Costs, Old Method (ratio to 1)	Ratio of New to Old Fixed Costs[b] (ratio to 1)	Elasticity of Demand	Minimum Unit Cost Ratio[c] (per cent)
Row	t	r	nt	k	h_1	E	
1	2	.05	15	4	1	6	90.3
2	4	.05	15	4	1	6	87.0
3	2	.10	15	4	1	6	81.1
4	2	.05	30	4	1	6	80.1
5	2	.05	15	1	1	6	60.9
6	2	.05	15	4	1.50	6	84.0
7	2	.05	15	4	1	2	93.8
8	4	.10	30	1	1.50	2	18.6
9	2	.10	30	1	1.50	2	20.8
10	4	.05	30	1	1.50	2	37.9
11	4	.10	15	1	1.50	2	39.4
12	4	.10	30	4	1.50	2	60.8
13	4	.10	30	1	1	2	21.4
14	4	.10	30	1	1.50	6	20.9

[a] Based upon constant variable cost functions for both methods.

[b] h_1 gives the ratio of the fixed costs of the new component, responsible for the cost-savings, to the fixed costs of the old component it displaces.

[c] The figures in this column express, for the conditions specified and at respective optimum outputs, the ratio of average total unit costs of the new method to average total unit costs of the old method at which the enterprise would be indifferent between the two methods.

ing the former set of rows with row 1 and the latter set with row 8, it is possible to observe the influence of each variable on the unit cost ratio. We find that increases in t, r, nt and h lower the ratio and that increases in k raise it. The effects of E are more complex. Increases in E may increase or reduce the ratio, depending upon the values jointly assumed by the other variables.

III. *Some Implications of Interrelatedness*

A hypothetical example should help to illustrate the influence of the several variables and should provide a basis for better appreciating the significance of interrelatedness.

Take the case of a given industry in each of two regions, A and B. In region A the industry is old and relatively "mature," has largely saturated its market and is experiencing a comparatively slow rate of growth. In region B the same industry is in an embryonic state, has barely tapped its market potential and, as is the case with most industries in their early stages, is undergoing rapid expansion. Assume further that in both regions the industries employ the same production method—one entailing use of a fixed factor comprising several interrelated components—and enjoy the same costs and productivities.

If now there should be a cost-saving innovation which affects a single component and if, for reasons like those specified earlier, the fitting of this innovation into the prevailing set of components is impossible, so that use can be made of it only if a completely new set of related components are simultaneously adopted, then the two industries will be affected differently. The industry in region B (industry B), because it is extending its facilities, will construct those facilities to the specifications required by the innovation. It will largely bypass the complications of interrelatedness by utilizing the innovation, together with the modified auxiliary components, as additions to existing capacity.[14] The industry in region A (industry A), because it has need to extend its capacity little if at all, will adopt the innovation and its related components only if it can use them profitably as a replacement for its existing facilities.[15] Whether it can or not will depend upon the values of the several relevant variables. The table indicates that an innovation which

[14] It will not *completely* by-pass the complications since, unless it is starting from scratch, it will possess some facilities based on the old method But the fewer those facilities and the more rapid its rate of growth, the smaller will be its problem. Moreover, for reasons explained later, it probably will be true that complications facing the new industry in respect solely of its old equipment will be fewer than those facing the old industry, particularly if the new industry is part of a newly developing industrial environment and the old industry a part of an established and mature industrial environment.

[15] This statement assumes that, for whatever reason, entry of new firms is blocked As is developed in Section V, interrelatedness may itself constitute a barrier to entry.

offers substantial savings may be compatible with continued use of the old method.[16]

Assuming for the sake of simplicity that row 4 describes the present situation and that the minimum unit cost ratio is the actual ratio, the following observations are applicable:

1. Revenue less future costs for industry A is equal to revenue less total costs for industry B. The present value of future costs is identical for both industries.

2. Industry B's unit costs are lower than those of industry A by 19.9 per cent. If the innovation is labor-saving, industry B's labor productivity will be higher than A's.

3. A logical procedure for industry A would be to write off the whole of the remainder of its past investment. Let the aggregate of fixed costs—the total of outlays for the several components—of the old method equal C and assume that the components wear out at intervals equally spaced in time. Then if the timing of the innovation coincided with the wearing out of the component it would replace, the necessary write-off would amount to $\frac{1}{4}C$.[17]

4. It seems likely that in the ordinary institutional setting the industry frequently would be unwilling or unable to write off the necessary amount—in the present case a sum equal to 25 per cent of its original investment. More probably it would maintain its capital at full book value, or would endeavor to do so. Whether it succeeded would depend upon whether it faced competition from industry B in its own market, industry B's market or in third markets. Without such competition it could continue as though the innovation had never been developed, though with higher costs, lower productivity and higher prices than industry B.

5. If a capital write-down is not undertaken, if an inflated capital base is perpetuated and if, in absence of competition with industry B, prices are maintained, investors will, in effect, have shifted responsibility for their lack of perfect foresight to other factors whose returns will be lower than otherwise, and to consumers. More generally the level of output of industry A, the distribution of income and the magnitude of savings and investment will be "distorted."

[16] A somewhat similar situation may arise in the absence of interrelatedness, *i.e.*, where $t = 1$. An instance is where the new method yields its savings only at substantially higher levels of output; levels which, with the existing demand function, are unprofitable. However, this does not alter the implications of interrelatedness. In this case its effect is to intensify (rather than originate) the disparity in unit costs between the two methods that is compatible with continued use of the old method. The "net" effect of interrelatedness then becomes the difference between the unit cost ratio when $t = 1$ and that ratio when $t > 1$. This point requires no important qualifications to the observations made in the text.

[17] $\frac{1}{4}C$ because there are but two components one of which has been completely depreciated and the other of which has been depreciated by half.

6. If there is competition between industry A and industry B, prices will tend to fall to the level set by costs in industry B. This may result in a forced write-down of capital in industry A and a reduced return to its investors, or a lower return to other factors, or both. Industry A may then appear as a weak and struggling competitor in interregional trade, with its costs relatively high and its productivity low.

7. The crux of the difficulty to which interrelatedness gives rise is capital obsolescence. From this follow the several secondary effects mentioned above. To be sure, this difficulty arises as well in a conventional technological world where t equals 1. But the magnitude of such obsolescence generally will be considerably less than in a world ruled by an interrelated technology. In the illustration just used (row 4 of Table I), had t been taken as 1 instead of 2 there would have been no obsolescence problem since timing of the innovation was assumed to coincide with the wearing out of the relevant component. More generally we can say that when $t > 1$ and cost and demand conditions relating to the old and new methods are such as to leave the decision-maker indifferent between them then, depending on the timing of the innovation, the amount of obsolescence will vary from a minimum of $C\frac{t-1}{2t}$ to a maximum of $C\frac{t+1}{2t}$. When $t = 1$, obsolescence will vary between zero and an amount equal to the total fixed cost of the single component.[18] Should the timing of the innovation coincide with the wearing out of the relevant component, the *increase* in obsolescence resulting from an interrelated technology will be given by the expression $C\frac{t-1}{2t}$. As t increases, this expression approaches a limit of $\frac{1}{2}C$.

IV. *Effects on the Rate of Innovation*

To answer the question, "How do changes in each of the variables affect the degree to which, with interrelatedness, innovation is retarded," it is necessary to consider the effect of such changes on (1) the "profit gap"; and (2) the "profit potential" of the new method.

Interrelatedness has the effect of requiring the new method, if it is to be introduced, to earn higher profits than would otherwise be necessary. Let the difference between required profits with interrelatedness and required profits without it be called the "profit gap." The size

[18] It must be remembered that for $t = 1$ this fixed cost is smaller than for $t > 1$. Thus, maximum obsolescence in the former case may well be less than even the minimum obsolescence in the latter case

of this gap may be taken, in any particular case, as a measure of the handicap imposed on innovation by interrelatedness.

The "profit potential" is simply the profit function of the new method, since this function describes the ability of the method to earn profits. Besides affecting the profit gap, changes in certain of the variables will, other things equal, alter the profit potential. A change in one of the variables might, for example, increase the profit gap but increase the profit potential also. In this case we could not determine, without further information, whether the change served to intensify or diminish the delay interrelatedness causes to innovation.

It is tempting to infer that the combined effect on the profit gap and the profit potential[19] of a change in any one of our six variables is similar to its effect on the minimum unit cost ratio. Thus, if an increase in a variable reduces the ratio, it might be supposed that it also would increase the delay in innovation by increasing the profit gap and reducing the profit potential. However, that is not strictly true. It is found that increases in r and reductions in k increase the profit gap and reduce the profit potential; that increases in t increase the profit gap without affecting the profit potential; that increases in h reduce the profit potential without affecting the profit gap; that increases in nt increase the profit gap but leave the profit potential indeterminate; and that increases in E generally decrease the profit gap but have an indeterminate effect on the profit potential. In the last two instances the outcome on balance is indeterminate unless the conditions of the problem are further specified. With respect to changes in the other four variables, a few words will be offered on the implications for a developing economy.

The illustration used earlier assumed that industry B, by virtue of its later start than industry A, grew more rapidly than the latter. This more rapid growth meant that a t factor of any given size would retard innovation less for B than for A. The earlier model also assumed that the two industries employed the same techniques and had the same costs. However, it is generally the case that in less industrialized regions, in contrast to more advanced regions, factor price ratios conduce to employment of simpler, direct-labor production methods. If industry B is in such a region, while industry A is in an advanced one, then industry B can be expected to use relatively little capital and capital of a relatively simple type. In this event we have another reason why the t factor—lower now for B than for A—will be less unfavorable to B.

This argument implies that B's state of technology is more rudimentary than A's and does not, therefore, reinforce the case for lower

[19] See the Appendix, Part II, for the relevant functions.

costs and greater competitive strength in B than in A.[20] But since a lower *t* means a smaller handicap to innovation, it does suggest that B will be able to move up the technological ladder from its existing, rudimentary position more rapidly than will A from its existing, more advanced position. It suggests, in other words, a supplementary reason for supposing that a young industry will grow faster than an older, more fully developed industry. It also helps to explain why industries in newly developing economies tend to catch up with their counterparts in more advanced economies.

Since region B is underdeveloped as compared with A, factor price ratios will conduce to the use of a less roundabout method by industry B than industry A. For this reason we should expect the ratio of variable to fixed costs, *k*, to be greater for industry B. With other things equal, larger *k* values cause a smaller handicap to innovation than do smaller *k* values. Industry B will, on this account, suffer a smaller handicap than mature industry A.

On the other hand, we might expect that *r* would be higher for industry B than for industry A because of the more limited supplies of capital available to industry B, because of a higher marginal productivity of capital in region B—hence higher opportunity costs for using capital, and because of greater uncertainty in region B as to future investment opportunities and future rates of return. This circumstance would tend to diminish the effects of any given difference in *t* between industries A and B.

If a generalization is possible with respect to *h*, perhaps it is that the effects on industries A and B will not differ significantly. Adoption of a new method usually calls for greater capital costs than did the old method,[21] and this probably is as true for the industry in the less developed as that in the more developed region. We may conclude provisionally that *h* is neutral in its impact, neither intensifying nor mitigating the effects of a difference in *t* between industries A and B.

The matter can be put in a different perspective by dropping the comparison between regions and industries and applying the same principles to a single industry in a single region as the industry develops and at the same time the region becomes increasingly industralized. As

[20] It is certainly conceivable that B, utilizing much more rudimentary production methods than A, would find it profitable to "jump" to a much higher technological level by adopting a highly capitalistic innovation which A, because of interrelatedness, found it uneconomic to adopt. B would be aided in such a jump by a low *t* factor and would be hindered by adverse factor price ratios. But in general we would expect both industries to adjust to those new methods which are proximate technologically to the methods they currently employ.

[21] Our reference is to total capital costs, not capital per unit of output. Advancing techniques have brought with them larger optimum outputs. A rising *h* is therefore compatible with either rising or falling capital costs per unit of output.

the industry and the region develop, a rising t factor will pose a growing handicap to innovation. This handicap will be intensified by a rising ratio of fixed to running costs and mitigated by a falling discount rate. It will be little affected by h, which remains relatively stable. The outcome on balance cannot be determined without reference to empirical data.

V. *The Theory Related to Actual Conditions*

To what extent is our analysis relevant to the complex production conditions prevailing in practice? No precise answer is possible. However, conditions in certain British industries suggest that interrelatedness has been and is a factor of consequence. Supplemental considerations bearing on the relationship between technological and certain institutional factors lend force to this conclusion. Let us take up the supplemental considerations first.

The existence of interrelatedness need not presuppose a rigid and rudimentary interdependence among a series of machines, and it ought not to be regarded as a by-product only of peculiar types of fixed capital. Its compass may include any of the elements, including the institutional ones, that make up an industry's technology. Broadly construed, technology embraces far more than physical plant and equipment. It extends also to the kinds and qualities of raw material, the labor skills, the managerial know-how and the administrative organization necessary to productive activity. Proliferation of interconnections among these elements and between them and plant and equipment is as likely, perhaps more so, as growth of interconnections among elements of plant and equipment alone. A new and more efficient machine may function efficiently, if at all, only if fed raw materials different in kind or quality from those previously used. Or it may require that those materials first be subjected to preparatory processing not previously required. Again, effective use of new equipment may call for direct labor, supervisory or maintenance skills that are not readily available and development of which in adequate quantities would require much time and expense. Or it might happen that certain equipment changes are feasible only if accompanied by a switch from singleshift to multishift working, while a short labor supply makes such a switch impossible. In still other instances use of a new method might require an expansion in output or some change in product quality which firms, for reasons of cost or want of enterprise, are reluctant to attempt.

These few examples point to the very wide field over which interconnections can develop. Elements of an institutional nature in addition to those relating to physical plant and equipment may be involved, blending with and re-enforcing one another. Their effects may not be so

readily measurable as they are where a series of machines are linked together in simple interdependence, but that does not diminish their significance for innovation decisions.

A second consideration relates to the pattern of ownership. If ownership at each of the several stages of production or within each of the stages of production is fragmented, it may prove impossible fully to consider, let alone to adopt a new method. This situation may be described as one where the relevant technological unit is larger than the ownership or decision-making unit. Instances of it can be found in the British textile and steel industries, among others.[22]

Returning for illustration to the example used earlier, suppose that each of the interrelated components is separately owned. If then a cost-saving substitute for one of the components is developed, the user of the component in question will be unable to innovate barring cooperation from other users. In this situation at least three alternatives present themselves: (a) The user of the obsolete component could try to induce cooperation from others by offering to share his gains with them. He might do this by quoting higher prices to his suppliers and lower prices to his purchasers. However, the potential gains from the innovation would have to be large indeed to provide, after being shared three ways, the necessary incentives to change. Further, the risks would devolve mainly upon a single user, the initiating innovator, creating a formidable obstacle to action. (b) The user of the obsolete component could go into competition with those whom he formerly supplied or from whom he formerly purchased by undertaking the several related phases of production himself; alternatively, he might buy out his suppliers and/or purchasers. He then would be in a position to adopt the new method. For several reasons—lack of knowledge of the related phases of operations and their costs, lack of financing,[23] reluctance to make heavy outlays in face of uncertainty, pre-emption and monopolization of the related fields by others—he might well be unable or unwilling to pursue either of these alternatives. (c) Not least likely is the possibility that the new method would be given little or no consideration. Since its introduction would require solution of problems external to the firm, the firm might justifiably disregard it, just as it disregards all those events to which it has no power to adjust.[24] In situations of this type

[22] *Infra*, pp. 312-13

[23] Lack of financing is important Even if the entrepreneur is convinced on the basis of proper calculations that an innovation is economically sound, he may not be able to convince the banks or the capital markets of this; they must discount because of their uncertainty that the entrepreneur is right.

[24] The situation would not differ basically if innovation gains were distributed all along the line instead of being limited to a single component. Successful adjustment would remain outside the power of any single firm. Cooperation among firms and a measure of coordination among them in effecting changes still would be necessary.

there is no definite limit to the cost disparity between old and new methods compatible with continued use of the old method.[25]

The last few paragraphs lead to the conclusions that virtually all of the elements in the production process are susceptible to the effects of interrelatedness and that interrelatedness need not exist in any rigid, formal, measurable way to be a factor of consequence for innovation decisions. They also indicate that interrelatedness may be important for an industry even where firms fail, because of problems generated that are external to themselves, to give it explicit recognition.

The British railway system presents something of a classic case in illustration of our general thesis. As a result of a decision as to loading gauge made in the nineteenth century, tunnels and stations restrict vehicles to eight feet in width, while on the continent and in the United States the figure is between nine and ten feet with a correspondingly greater latitude in height. This condition affects not only the possible size of car and load. As early as 1900 it prevented use in Britain of the most powerful locomotives essential to maximum economy.[26] Veblen had reference to this situation when he spoke of "the silly little bobtailed carriages used in British goods traffic; which were well enough in their time, before American or German railway traffic was good for anything much, but which have at best a playful air when brought up against the requirements of today. Yet the remedy is not a simple question of good sense. The terminal facilities, tracks, shunting facilities, and all the ways and means of handling freight on this oldest and most complete of railway systems, are all adapted to the bobtailed car. So, again, the roadbed and metal, as well as the engines, are well and substantially constructed to take care of such traffic as required to be taken care of when they first went into operation, and it is not easy to make a piecemeal adjustment to later requirements."[27]

[25] Attainment of economies through integration of facilities and their operation on a coordinated basis is generally recognized as a major stimulus to large-scale industry and as a factor of particular importance during the formative period of industrialization. Our concern here is with instances where integration ought to have been undertaken and was not, rather than with instances where it was successfully achieved whether it ought to have been or not.

[26] Charles H Grinling, "British Railways as Business Enterprises," in *British Industries*, edited by W. J. Ashley (London, 1907), p. 156.

[27] Veblen, *op. cit*, p 126. He went on to draw the not necessarily valid conclusion that, in the community's interest, the out-of-date equipment and organization probably ought to be "junked" He doubted that they would be because "it is the discretion of the business men that necessarily decides these questions, and the whole proposition has a different value as seen in the light of the competitive pecuniary interests of the business men in control." Our analysis has shown that it may be economic—in the social as well as private sense—to continue with an old, seemingly expensive method even though a new, cheaper one be available. In the case of railroads, where the t factor is large, the durability of capital great and the ratio of running to capital costs low, the cost disparity consistent with perpetuation of an old system doubtless is very large. If interrelatedness is internal and not external to the

Reference to developments in the British iron and steel industry during the latter part of the last century also will illustrate our thesis. In the 'sixties, 'seventies and 'eighties a number of technical changes were evolved which offered prospect of substantial economies in various phases of production. New and commercially feasible methods of steel ingot production were opened up through introduction of the Bessemer converter and the open hearth and electric furnaces; advent of the rolling mill made possible phenomenal savings in the shaping and finishing of steel products; the optimum size of the blast furnace was greatly increased; and significant fuel economies all along the line became possible. Most important, no single one of these changes would yield its potential savings in full except in conjunction with the others, and this fact made necessary a juxtaposed grouping of the several elements of the production process.

The economies attainable from such a grouping derived from several sources: from a reduction in transport and handling charges; from a fuller and more balanced utilization of plant capacity; from easier and more accurate control over product quality; and from fuel economies.[28] While there could be no absolute rule, concentration of coking ovens, blast furnaces and rolling mills on one site was generally found to be the most suitable arrangement. But it was more than merely placing the various kinds of plant in the same location. They had to be concentrated "in such proportions and on such a scale that the whole plant could work effectively and economically. . . . There had to be a sufficient number of coking ovens, blast furnaces and steel furnaces both to keep one another employed and to meet the requirements of the rolling mills."[29]

The technical changes that made possible the economies in question materialized in an era when the British iron industry already was well developed and resting solidly on the foundations of an older technology, when its rate of growth had declined to a relatively low level, and when its ownership structure had crystallized in a pattern inconsistent with the new technological need for integrated operation. As a result, in part at least, those changes had hardly begun to be assimilated by the third

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firm, and if pecuniary interests control decisions, what is apt to occur is not a failure to modernize when modernization ought to be undertaken, but rather a failure by businessmen to write down their capital (or refusal by a utility commission to allow them to do so even if they would). In the case of monopolistically controlled railways, whose rates are regulated on a cost basis, this would result in an inflated capital base, "excess" returns to owners, and unduly high charges to consumers.

[28] Committee on Industry and Trade, Part IV, *Survey of the Metal Industries* (London, 1928), p. 8.

[29] *Loc. cit.*

decade of the twentieth century.[30] Things appeared to be little better by midcentury.[31]

As a final illustration, we might compare the adjustment to the perfection of the automatic loom of the British with the American cotton weaving industry. The loom was first introduced around the turn of the century and by 1914 represented 31 per cent of the looms in operation in the United States. By 1919, the figure was 51 per cent and by 1939, 95 per cent. In Britain, by 1939, but 5 per cent of the looms were automatic and the figure is hardly greater today.[32] Of the few principal circumstances contributing to this outcome, it may be urged that technical interrelatedness is one. Lancashire's industry experienced its great growth during the nineteenth century. It grew little after 1900, reaching its apogee with the first world war. In contrast, textile weaving in the United States expanded rapidly after 1900, and this expansion was coupled with a locational shift from the New England States southward that augmented the opportunity for technical modernization.

Because it grew but little, Lancashire's modernization problem was and remains primarily a replacement problem. Yet introduction of automatic looms demands more than replacement of one machine by another. For a great many firms it requires redesign of the weaving shed—often its complete rebuilding, strengthening of flooring, elimination of pillars, and respacing of machinery. It calls for equipment and method changes in the preliminary processing of yarn;[33] in this regard it gives cause for an integration of spinning with weaving, something for which the industry, long established on horizontal lines, is not well suited. It creates a need for product simplification and for a change in the traditional practices of converters in allocating orders to weavers, so that long runs of given fabric types may be attained.[34] Certain of the inter-

[30] In 1928 the Balfour Committee observed " . that few British works, if any, are modern throughout in equipment and practice, with coking ovens, blast furnaces, steel furnaces and rolling mills adjacent to one another, and making full use of waste gases. Moreover, there is not infrequently a lack of balance between the productive capacity at different stages, e.g , deficient coking oven or blast furnace capicity." *Ibid* , p. 27.

[31] See R. A Brady, *Crisis in Britain* (Berkeley, 1950), pp 203-13. These pages provide an excellent illustration of the thesis under discussion.

[32] R. Gibson, *Cotton Textile Wages in The United States and Great Britain, 1860-1945* (New York, 1948), p. 70.

[33] For example, it requires weft yarn in larger packages Modern ring spinning equipment will produce yarn in these larger packages or in a state suitable for easy rewinding, but most of the existing spinning equipment in Lancashire will not.

[34] For data on use of the automatic loom in Lancashire and some of the problems to which its introduction gives rise see the Cotton Board Conference reports, *Equipment and Labor Utilization in the Cotton Industry,* 1947; *Production, Quality, Costs,* 1948; *Reequipment and Labor Deployment,* 1948. See also *Cotton Weaving,* a report of the Anglo-American Council on Productivity (London, 1950).

connections, it will be noted, are external to the firm. Their presence, together with those internal to the firm, constitute a part of the explanation for Lancashire's continued reliance on the old power loom.

VI. *Conclusion*

By way of concluding, let us ask two questions: Is it the case, as Veblen alleged,[35] that Britain is paying a real penalty for having taken the lead and for having shown the way to countries industrializing at a later date? If she is paying a penalty, does it follow that the United States, Germany and Japan will be paying a comparable penalty at a later date?

To the first question there is a twofold answer. First, in face of a dynamic technology, interrelatedness always gives rise to an unusually heavy obsolescence problem—a problem which at best need have no deleterious effects but which, under usual conditions, can have distorting influences upon costs, prices, competitive strength, income distribution and future rates of growth. Second, where interrelatedness is external to the firm—where the technological unit is larger than the decision-making unit, as it frequently appears to be, the firm (or industry or economy) will face an additional handicap in its inability to adopt a new method when, by economic criteria, it ought to do so. These consequences, which would not arise in absence of interrelatedness, represent a real penalty on Britain for her early industrial leadership.[36]

As to the second question, let us note only two things: First, the effects of interrelatedness depend upon a number of variables some of which have been formalized mathematically and others of which, like the rate of growth and pattern of ownership, have been treated qualitatively. The relative importance of the several variables and their interactions determine the significance of interrelatedness, and we can expect both that importance and the mode of their interaction to vary among countries. Suggestions have been made, however, as to the probable tendencies of certain of these variables as the industry or economy matures. Second, it is well to remember that technological interrelatedness, with its effects on adaptation to innovation, is but one of many factors that condition the responsiveness of a maturing economy to

[35] The British have not "sinned against the canons of technology. It is only that they are paying the penalty for having been thrown into the lead and so having shown the way" *Op. cit.*, p 128.

[36] This is not at all to say the British would have been better off could they have postponed their march to industrialization. Neither is it to say *categorically* that they would be better off if they did not have to reckon with interrelatedness. After all, prodigals might live longer and more happily if they were not able to live so lavishly But surely it is reasonable to prefer the faster innovation, lower costs and higher returns which interrelatedness prevents to the slower innovation, higher costs and lower returns which it causes.

technological change. The other factors may seriously affect the role of interrelatedness one way or the other.

Mathematical Appendix

I

Insight into the effects of interrelatedness on unit cost and into the conditions determining the magnitude of those effects is obtainable through formalization of the problem as follows:

Let t = the number of components in the old method.

nt = the durability of capital of both the old and new methods.

n = the interval of differential durability, *i.e.*, the interval between replacements of the components of the old method. By assumption, $n=(nt)/t$. That is, the interval between replacements of each of the components is assumed to be the same. Allowing n to be uniquely dependent upon t and nt permits the problem to be set up with one less variable than otherwise.

r = the discount rate.

C = the total capital or fixed cost of the old method over the future period nt.

$c_1=c_2=c_3=c_t$ = the cost of each of the several components that comprise the fixed cost of the old method.

$$\sum_{1}^{t} c_i = tc = C.$$

C^* = the total capital or fixed cost of the new method over the future period nt.

v = unit variable costs of the old method (assumed invariant with output).

v^* = unit variable costs of the new method (assumed invariant with output).

$q_1=q_2=q_3=q_{nt}$ = the annual output with the old method.

$q_1^*=q_2^*=q_3^*=q_{nt}^*$ = the annual output with the new method.

If the comparison is made at a time when one of the components has worn out and requires replacement (and assuming that the salvage value of existing plant and equipment is zero), then the present value of the total of future outlays associated with continued use of the old method becomes

$$c_1 + \frac{c_2}{(1+r)^n} + \frac{c_3}{(1+r)^{2n}} \cdots \frac{c_t}{(1+r)^{n(t-1)}} + vq_1$$
$$+ \frac{vq_2}{(1+r)} + \frac{vq_3}{(1+r)^2} \cdots \frac{vq_{nt}}{(1+r)^{nt-1}}$$

which upon summing and combining terms reduces to

$$C\left[\frac{(1+r)^{-nt}-1}{t(1+r)^{-n}-t}\right]+vq\left[\frac{(1+r)^{-nt}-1}{(1+r)^{-1}-1}\right]. \tag{1}$$

The present value of the total of future outlays associated with adoption of the new method for the period nt is

$$C^*+v^*q_1^*+\frac{v^*q_2^*}{(1+r)}+\frac{v^*q_3^*}{(1+r)^2}\cdots\frac{v^*q_{nt}^*}{(1+r)^{nt-1}}$$

which upon summing and combining terms reduces to

$$C^*+v^*q^*\left[\frac{(1+r)^{-nt}-1}{(1+r)^{-1}-1}\right]. \tag{2}$$

Given a demand function of constant elasticity

$$p=\frac{a}{q^{\alpha}} \tag{3}$$

where p = price, q = output, a is some constant and $-\alpha$ is the reciprocal of the elasticity of demand, the respective revenue functions over the period nt become

$$aq^{1-\alpha}\left[\frac{(1+r)^{-nt}-1}{(1+r)^{-1}-1}\right] \tag{4}$$

and

$$aq^{*1-\alpha}\left[\frac{(1+r)^{-nt}-1}{(1+r)^{-1}-1}\right] \tag{4a}$$

and the profit functions, π and π^*, are

$$\pi=aq^{1-\alpha}\left[\frac{(1+r)^{-nt}-1}{(1+r)^{-1}-1}\right]-vq\left[\frac{(1+r)^{-nt}-1}{(1+r)^{-1}-1}\right]-C\left[\frac{(1+r)^{-nt}-1}{t(1+r)^{-n}-t}\right] \tag{5}$$

$$\pi^*=aq^{*1-\alpha}\left[\frac{(1+r)^{-nt}-1}{(1+r)^{-1}-1}\right]-v^*q^*\left[\frac{(1+r)^{-nt}-1}{(1+r)^{-1}-1}\right]-C^* \tag{5a}$$

At optimum outputs

$$\frac{\partial\pi}{\partial q}=0,\quad\text{and}\quad q=\frac{v^{-1/\alpha}}{[a(1-\alpha)]^{-1/\alpha}} \tag{6}$$

$$\frac{\partial\pi^*}{\partial q^*}=0,\quad\text{and}\quad q^*=\frac{v^{*-1/\alpha}}{[a(1-\alpha)]^{-1/\alpha}}. \tag{6a}$$

If now at respective optimum outputs the enterprise is indifferent between continuing with the old method and adopting the new method, we have $\pi=\pi^*$ or, with substitutions

$$\frac{v^{1-1/\alpha}}{[a(1-\alpha)]^{-1/\alpha}}\left[\frac{(1+r)^{-nt}-1}{(1+r)^{-t}-1}\right]\left[\frac{\alpha}{1-\alpha}\right]-C\left[\frac{(1+r)^{-nt}-1}{t(1+r)^{-n}-t}\right]$$
$$=\frac{v^{*1-1/\alpha}}{[a(1-\alpha)]^{-1/\alpha}}\left[\frac{(1+r)^{-nt}-1}{(1+r)^{-t}-1}\right]\left[\frac{\alpha}{1-\alpha}\right]-C^*. \tag{7}$$

A meaningful economic relationship is that between capital cost outlays and variable cost outlays over the period nt. For the old method

$$\text{Capital cost outlays} = C$$

$$\text{Variable cost outlays} = v\left[\frac{v^{-1/\alpha}}{[a(1-\alpha)]^{-1/\alpha}}\right]nt = nt\left[\frac{v^{1-1/\alpha}}{[a(1-\alpha)]^{-1/\alpha}}\right]$$

Let

$$nt\left[\frac{v^{1-1/\alpha}}{[a(1-\alpha)]^{-1/\alpha}}\right]=kC. \tag{8}$$

Let

$$C^*=hC. \tag{9}$$

With the substitutions permitted by (8) and (9), (7) can be written as

$$\frac{v^{*1-1/\alpha}}{[a(1-\alpha)]^{-1/\alpha}}\left[\frac{(1+r)^{-nt}-1}{(1+r)^{-t}-1}\right]$$
$$=C\left(\frac{k}{nt}\left[\frac{(1+r)^{-nt}-1}{(1+r)^{-t}-1}\right]-\left[\frac{(1+r)^{-nt}-1}{t(1+r)^{-n}-t}-h\right]\left[\frac{1-\alpha}{\alpha}\right]\right). \tag{10}$$

By postulating indifference between the two methods, *i.e.*, revenue less future costs of the old method equal to revenue less future (and total) costs of the new method, we are in a position to determine the maximum possible effects of interrelatedness on costs. Were the cost-savings available from the new method any greater, its profits would be greater, and it would be preferred over the old method.

When the enterprise is indifferent between the new and the old methods,

what is the ratio, in present values and at respective optimum outputs, between their average total unit costs? For the new method, average total unit cost is given by

$$
(11)\qquad \frac{C^{*} + \dfrac{v^{*1-1/\alpha}}{[a(1-\alpha)]^{-1/\alpha}}\left[\dfrac{(1+r)^{-nt}-1}{(1+r)^{-1}-1}\right]}{nt\left[\dfrac{v^{*-1/\alpha}}{[a(1-\alpha)]^{-1/\alpha}}\right]}
$$

where the first term in the numerator expresses capital cost and the second term expresses total variable cost, both for the period nt, at the optimum rate of output, and in present values. The denominator gives total output for the period nt when output is at the optimum rate.

With the old method there is a cost allocation problem. Part of the outlays for components purchased in earlier years is attributable to the period nt because those components yield up services and wear out during this period. Similarly, part of the outlays for components to be purchased during the period nt are allocable to the subsequent period. Because of the assumptions of equal durabilities for all components and equal intervals of differential durability, that fraction of earlier outlays allocable to nt is exactly offset by the fraction of outlays during nt that is allocable to the subsequent period. We may simplify further by assuming that the accruals and discounts on these two sums exactly offset each other. Then average total unit cost for the old method is

$$
(12)\qquad \frac{C + \dfrac{v^{1-1/\alpha}}{[a(1-\alpha)]^{-1/\alpha}}\left[\dfrac{(1+r)^{-nt}-1}{(1+r)^{-1}-1}\right]}{nt\left[\dfrac{v^{-1/\alpha}}{[a(1-\alpha)]^{-1/\alpha}}\right]}.
$$

Dividing (11) by (12), substituting on the basis of (8), (9) and (10), and combining terms gives

$$
(13)\qquad \frac{\left(\dfrac{k}{nt}\left[\dfrac{(1+r)^{-nt}-1}{(1+r)^{-1}-1}\right]\right)^{-1/(\alpha-1)}\left(h+\dfrac{k}{nt}\left[\dfrac{(1+r)^{-nt}-1}{(1+r)^{-1}-1}\right]-\left[\dfrac{(1+r)^{-nt}-1}{t(1+r)^{-n}-t}-h\right]\left[\dfrac{1-\alpha}{\alpha}\right]\right)}{\left(1+\dfrac{k}{nt}\left[\dfrac{(1+r)^{-nt}-1}{(1+r)^{-1}-1}\right]\right)\left(\dfrac{k}{nt}\left[\dfrac{(1+r)^{-nt}-1}{(1+r)^{-1}-1}\right]-\left[\dfrac{(1+r)^{-nt}-1}{t(1+r)^{-n}-t}-h\right]\left[\dfrac{1-\alpha}{\alpha}\right]\right)^{-1/(\alpha-1)}}.
$$

This expression tells us, in present values and at respective optimum outputs, the ratio of average total unit costs of the new method to average total unit costs of the old method when the enterprise is indifferent between those methods. It forms the basis for Table I.

II

A. The profit gap:

The difference between the profit required of the new method when inter-

relatedness exists and the profit required in its absence is obtained by subtracting from the left-hand side of (7) the same expression when $t=1$. This gives

$$C\left(1-\left[\frac{(1+r)^{-nt}-1}{t(1+r)^{-n}-t}\right]\right). \tag{14}$$

Substituting for C on the basis of (8) gives for the profit gap

$$\frac{nt}{k}\left[a(1-\alpha)\right]^{1/\alpha}\left[v^{1-1/\alpha}\right]\left(1-\left[\frac{(1+r)^{-nt}-1}{t(1+r)^{-n}-t}\right]\right). \tag{15}$$

B. The profit potential:

This is simply the profit function of the new method. From (5a) modified by (6a), (8) and (9) we have

$$\pi^{*}=\left[a(1-\alpha)\right]^{1/\alpha}\left(v^{*1-1/\alpha}\left[\frac{(1+r)^{-nt}-1}{(1+r)^{-1}-1}\right]\left[\frac{\alpha}{1-\alpha}\right]-\frac{hntv^{1-1/\alpha}}{k}\right). \tag{16}$$

A THEORETICAL FRAMEWORK FOR TREASURY DEBT MANAGEMENT

By Jacob Cohen*

In discussing Treasury debt management, a useful approach would seem to be to pose the various alternatives open to the Treasury and then to consider their respective implications. These alternatives can best be formulated in terms of their interest costs. We shall first develop the pure interest-saving model.[1] Then we shall discuss the implications of this model for liquidity. Following that, departures from the interest-saving model will be studied in terms of their effects on liquidity. It is hoped that the relationships that we develop may provide a framework for discussing the major problems of debt management—the selection of the "best" kind of securities and their allocation among different investor classes.

I. *The Pure Interest-Saving Model*

In constructing our interest-saving model, we assume a single debt operation with the Treasury aiming at a given volume of debt revenues. We rule out "printing-press money," direct recourse by the Treasury to the central bank, or the use of compulsion by the Treasury.

There are many alternative ways of treating the transaction between the Treasury and the market. The latter could be thought of as supplying loanable funds or purchasing claims. If the latter approach is followed, there is the question as to how to treat the demand curve. Amounts of securities purchased could be a function of different nominal interest rates with each unit being sold at par, or alternatively they could be a function of different bond prices with securities being redeemable at par. The latter alternative is the one that will be followed. Our demand curve, then, is a demand for claims in terms of the prices of these claims.

If the Treasury is to minimize interests costs, it must offer holders a maximum of special features. This will reduce interest costs by increasing the demand for government securities and/or increasing coefficients of elasticity. It must at the same time be a discriminating monopolist capable of segregating markets for its debt and setting the

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[1] "Interest-saving" is used synonymously throughout with "interest-reducing."

highest interest yields (lowest prices) in the most elastic markets. The pure interest-saving model thus implies debt which is transferable within a given market but nontransferable between markets.

Perhaps the most important special feature that the Treasury can confer on its obligations is that of liquidity.[2] In our interest-saving model we assume that all issues are redeemable on demand either at the Treasury or at the central bank at fixed prices.[3] Redemption prices would be so set that the redemption of issues before their maturity would never carry any penalty; the holder would always be returned his capital investment and the effective interest rate. This should make it a matter of indifference to the investor whether he is offered short-term or long-term securities.[4] His demand curve for debt should be unaffected by its maturity. It should then be a matter of indifference from the standpoint of the Treasury as to what maturities it sells in a particular debt operation. The Treasury, however, might prefer one maturity length over another in order to avoid bunching refunding dates. We can then assume that the Treasury offers different maturities but that the interest return is the same regardless of maturity.

We are now ready to develop the pure case of Treasury interest-saving. We shall assume that the submarkets for debt are the commercial banks and the nonbank public. These categories would appear to have the most distinctive demand curves. Moreover, debt policy questions focus on these alternatives. Our primary concern throughout this paper will be with the best kind of securities to offer the banks and the nonbank public and the best allocation of the selected issues between these two markets.

In Diagram 1 we have drawn the bank aggregate demand curve to suggest perfect elasticity of demand. We assume that the purchase of assets by the individual bank results in a more or less equivalent increase in its deposit liabilities rather than in a loss of legal reserves. Under these circumstances, at some interest return above the costs of money creation

[2] For a discussion of the various kinds of special features that have been offered by borrowing governments, see my "On the Theory and Measurement of Treasury Interest Saving," *So. Econ. Jour.*, Jan. 1951, XVII, 257 ff., and "The Element of Lottery in British Government Bonds, 1694-1919," *Economica*, Aug. 1953, XX, 237 ff.

[3] The concept of redemption at the central bank suffers from certain ambiguities. The process described is indeed redemption from the standpoint of the holder of these issues. He can cash them in any time he wishes at a price fixed in advance of his purchase. From the standpoint of the central bank which is redeeming issues, the transaction is actually more than that. The central bank acquires ownership of these issues and can presumably resell them in the market designated by the security if it so desires. In future discussions of central bank purchase at fixed prices, we shall mean the same thing by central bank "redemption" and "purchase" of issues.

[4] The investor under these circumstances might prefer long-terms because they avoid the necessity of continual refundings but we can assume this to be a relatively unimportant factor.

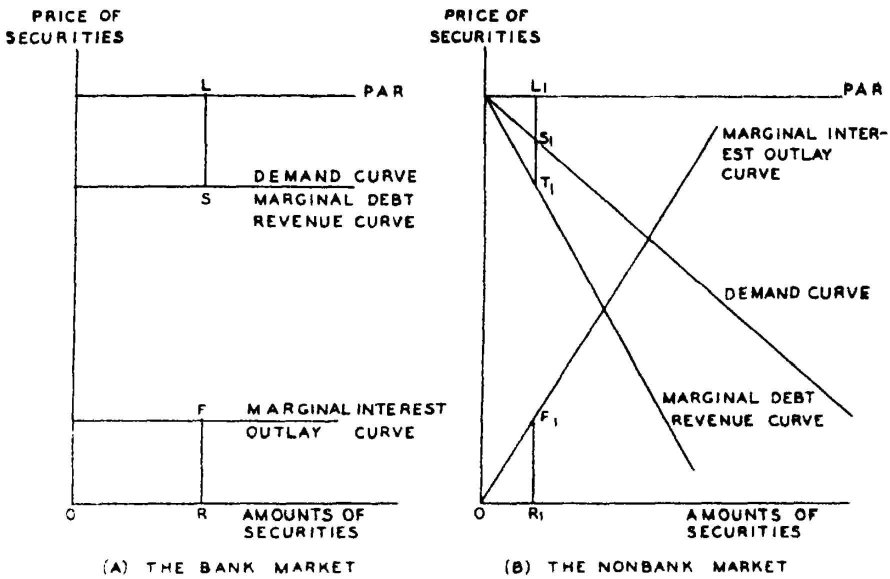


DIAGRAM 1 THE BANK AND NONBANK MARKETS FOR SECURITIES

the individual bank should be willing to buy as many government securities as are offered to it. For every dollar of government bonds that it purchases will only require the redemption of a fraction of this amount in order to secure the necessary increase in legal reserves as deposit liabilities expand. The individual and thus the aggregate bank demand curve for debt should thus approach perfect elasticity.[5]

We should expect considerably less elasticity in the nonbank demand curve for securities. As a matter of fact, what perhaps must be explained is why we would expect any positive response in security purchases to reductions in price. The consensus among economists seems to be that savings are relatively insensitive to interest rate changes.[6] When govern-

[5] It may be thought that our assumptions about elasticity are unduly restrictive. Even if the individual bank could not expand in a multiple of its excess reserves, could not the demand curve on the part of the *commercial banking system* approach perfect elasticity because of the possibilities of multiple bank expansion for an entire banking system? Unless some bank or banks had excess reserves to begin with, this would not be so. For without initial excess reserves, the individual bank in the banking system would not purchase a government bond if it had to cash the bond in order to meet subsequent losses in legal reserves. Perfect elasticity in the commercial banking system's demand curve would thus seem to entail perfect elasticity in the individual bank demand curve which in turn depends on the individual bank only having to redeem part of its purchases in order that it may continue to have legal reserves equal to required reserves.

[6] See, *e.g.*, L. R. Klein, "Savings Concepts and Data: The Needs of Economic Analysis and Policy," in *Savings in the Modern Economy*, W. W. Heller, ed. (Minneapolis, 1953), pp. 109, 127-28; H. C. Murphy, "The Role of Interest Rates in a Changing World," *Jour. Fin.*, June 1951, VI, 238 ff; R. I. Robinson, "Monetary Aspects of Fiscal Policy," in *Fiscal Policies and the American Economy*, K. E. Poole, ed. (New York, 1951), p. 71.

ment securities are assumed to be perfectly liquid the demand for securities would presumably show a similar insensitivity. For why would the nonbank public not buy as many securities at high prices (low yields) as they would at low prices (high yields)? Complete liquidity implies that if interest yields increase, low-yielding securities could always be converted into high-yielding issues without loss.

Yet there are several reasons why we would expect a negative slope to our nonbank demand curve. The nonbank public will be induced to buy more securities at low prices than at high prices because interest yields will then be worth the cost and inconvenience of investing. More importantly, the possibilities of a future fall in yields and a subsequent capital gain are increased at lower prices.[7] Finally, if we do not insist on a covariation in yields in other markets, investors will shift into government securities as they fall in price.

In later discussion we shall relax our assumption that nonbank issues are completely liquid. The nonbank demand curve will then shift to the left. For now fewer governments would be purchased at any given security price because of the capital-loss effects of possible increases in market yields. The longer the maturity of the issue offered by the Treasury, the further to the left would nonbank demand lie because of the progressively greater possibilities of capital loss at any security price.

Once we are given the demand curve, a considerable amount of additional information can be read off our diagram. The marginal debt revenue curves indicate the added revenues from the sale of an extra unit of debt. We can also derive the marginal interest outlay curves once we know the demand and marginal debt revenue curves. Let us assume the sale of a one-year security in all markets. The discount from par at which a unit of securities is sold will be equivalent to an annual interest payment. In Diagram 1, such a discount in a given market is suggested by the distance from the horizontal par-value line down to the demand curve for the security (LS and L_1S_1). Distances in turn from the demand curve to the marginal debt revenue curve measure losses on previous units as the Treasury lowers its price to sell additional units. Since the marginal debt revenue curve is identical with the demand curve in the case of the bank market, this distance is shown only for the nonbank market (S_1T_1). The total distance from par to the marginal debt revenue lines (LS and L_1T_1) thus equals the extra interest costs (FR and F_1R_1) from the sale of an additional unit of securities at any given amount of security sales (OR and OR_1) in either market.

[7] Under the assumption of liquidity, there is an asymmetry in the effects of changes in yields on capital gains. Redemption at a fixed price protects the investor against capital loss when yields rise. On the other hand, a fall in yields will raise the market price of higher-yielding issues.

Once the Treasury has decided on the desired amount of debt revenues, the interest-minimizing allocation of debt between the two markets follows automatically. The Treasury will allocate the debt so that marginal interest outlays for each additional dollar raised will be the same in both markets. When the ratio of marginal interest outlays to marginal debt revenues in the bank market is equal to the same ratio in the nonbank market at the same time that the desired volume of debt revenues is being secured, the Treasury will have reached the interest-minimizing allocation. If we transpose terms from one numerator to the other denominator, this formulation is seen to be equivalent to equality in the ratio of marginal interest outlays in the bank and nonbank markets to the ratio of marginal debt revenues in these two markets.[8]

Not only are ratios equal but the terms of each ratio in the last formulation are themselves equal at interest-minimization. Marginal debt revenues in both markets will be equal and similarly for marginal interest outlays. This is illustrated by the equality of SR and T_1R_1 and the equality of FR and F_1R_1 in Diagram 1. The explanation lies in the fact that the marginal debt revenues and marginal interest outlays from any allocation of debt in a given market always sum up to the face value of the security (this face value being the same in both markets).

We can also tell what prices of securities and interest yields will be set in the two markets. Security prices will be highest in the less elastic market. Thus the Treasury will sell securities in the nonbank market for S_1R_1 and for SR in the bank market.

The argument can now be developed with greater generality by means of indifference curve analysis. The R curves in Diagram 2 represent indifference revenue curves. Each of these curves shows alternative combinations of bank and nonbank debt which yield the same amount of debt revenues. Curves farther to the right indicate successively higher levels of debt revenues. The successive slopes of each curve proceeding downwards reflect the behavior of marginal debt revenues in the bank and nonbank markets as allocations to the former market are increased. When relatively great allocations of debt are made in the nonbank market, marginal debt revenues there will be relatively low as compared with marginal debt revenues in the bank market. As a result, additions of successive units of bank debt will require the subtraction of rela-

[8] Stated algebraically, for interest minimization,

$$\frac{MIO_b}{MDR_b} = \frac{MIO_n}{MDR_n}$$

where the subscripts b and n indicate the bank and nonbank markets respectively. Transposing terms we get,

$$\frac{MIO_b}{MIO_n} = \frac{MDR_b}{MDR_n}.$$

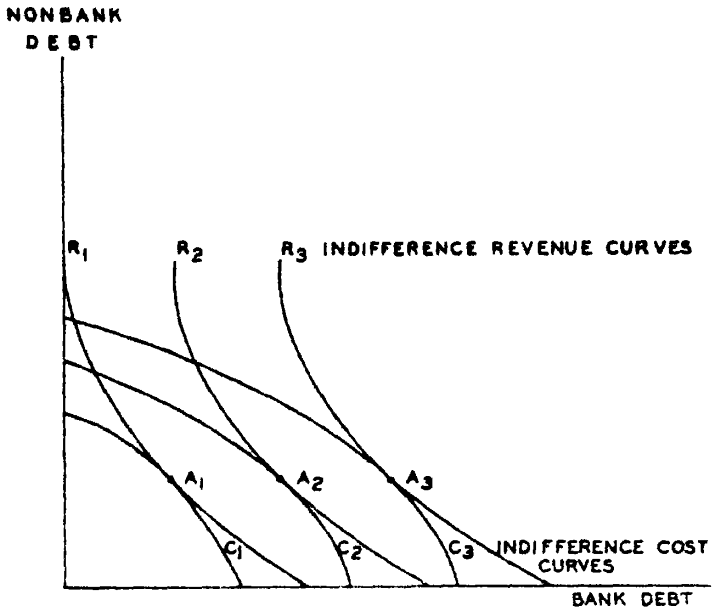


DIAGRAM 2 THE INTEREST-MINIMIZING ALLOCATIONS

tively large amounts of nonbank debt if total debt revenues are to be maintained on the same level. On the other hand, when relatively large allocations of debt are made to the bank market, marginal debt revenues from nonbank debt will be relatively high. Additions of bank debt will then require smaller reductions of nonbank debt in order to keep debt revenues constant. The curves are thus drawn convex from below.[9]

The indifference cost curves (C_1, C_2, etc.) respectively represent combinations of issues sold to the bank and nonbank public which carry the same total interest costs. The successive slopes of a given curve reflect the behavior of marginal interest outlays in the two markets. When relatively large allocations are made in the nonbank market, marginal interest outlays in that market will be relatively large as com-

[9] We have drawn the indifference revenue curves as negatively sloping. There may also be positively sloping sections to these curves. Two factors will have to be present for positively sloping sections in the upper portions of the revenue curves. First, the nonbank demand curve must have regions of inelasticity and negative marginal debt revenues. Second, desired revenues must be such that the onset of negative marginal revenues prevents the raising of the entire amount from the nonbank public. The R_1 curve has been drawn to suggest an absence of the second condition. Desired revenues are assumed low enough to permit the raising of all desired revenues from the nonbank public. The R_2 and R_3 curves terminate short of the nonbank axis because additional units of nonbank debt are assumed to carry negative marginal revenues. Since we assume perfect elasticity in the bank demand curve, there is not a similar possibility of positive slopes in regions of large amounts of bank debt and small amounts of nonbank debt.

pared with marginal interest outlays in the bank market. The addition of one more unit of bank debt will then require very small reductions in nonbank debt in order to keep the level of interest costs constant. When relatively large allocations are made to the bank market, marginal interest outlays will be relatively high in that market. Large reductions in nonbank debt then will be necessary with the addition of successive units of bank debt if interest costs are to be kept on an indifference level. The indifference cost curves are thus drawn concave from below.

The apparent bunching of the indifference cost curves on the nonbank vertical axis results from increasing marginal interest outlays on nonbank debt as sales to the nonbank public increase. Given increases in the level of interest cost will be represented by progressively smaller increases in the amounts of nonbank debt. On the other hand, the behavior of marginal interest outlays in the bank market will result in the same given increase in interest costs being represented by constant increases in the amounts of bank debt. Thus the indifference cost curves appear to flatten out as we move up the indifference cost map.

In the analysis of Diagram 1, the interest-minimizing allocation occurred when the ratios of marginal debt revenues in both markets equaled the ratios of marginal interest outlays. Expressed in indifference-curve terms, interest-minimization for a given level of debt revenues occurs at tangency of the relevant indifference revenue curve with some one indifference cost curve. At tangency, the ratios of marginal debt revenues and the ratios of marginal interest outlays must be equal. As would also be expected, the slopes of each curve at tangency equal unity ignoring algebraic sign. Marginal debt revenues are equal and similarly for marginal interest outlays.

The assumption of perfect elasticity in bank demand results in the tangency points of successive pairs of indifference cost and indifference revenue curves lying along a horizontal straight line as suggested by points A_1, A_2 and A_3 in Diagram 2. Minimization of interest costs for successively higher levels of debt revenues are effected without change in the amount of nonbank debt but with increasing amounts of bank debt.[10] If the bank demand curve were less than perfectly elastic but more elastic than the nonbank curve, the successive tangency points would lie on a positively sloping line the slope of which would be such that, for each increase in total revenue, the increase in bank debt would exceed the increase in nonbank debt.

[10] This can also be seen from Diagram 1. The assumption of perfect elasticity in bank demand results in the ratio of marginal interest outlays to marginal debt revenues being constant no matter what allocation is made to the bank market. There is only one possible allocation of debt to the nonbank public which can yield the same ratio Interest-minimization thus implies a unique allocation of debt to the nonbank public regardless of the amount of revenues borrowed.

This, then, is the pure interest-saving model, based on the maximum use of special features by the borrowing or refunding government. The alternate allocations of debt suggested by this model will have alternative implications for the level of liquidity and the level of interest costs. We must now discuss these implications.

II. *Interest Costs and Liquidity: The Interest-Saving Model*

The Primary Liquidity Relation

On the basis of Diagram 2 we shall develop the basic relationship between variations in interest costs and liquidity for a given level of debt revenues.[11] This relationship is initially described by the L_1 curve of Diagram 3. We shall refer to it as the primary liquidity relation. Numerical values have been assigned to various points on the axes of the diagram in order to facilitate the exposition. Underlying these values are the following assumptions. Desired debt revenues in the given debt operation amount to $10 billion. The bank demand curve is perfectly elastic at the security price of $95. Five million units of securities can be sold to the nonbank public at a price of $99 and every one dollar reduction in price will be accompanied by a five million increase in the number of units demanded.

The L_1 curve begins at the amount of bank sales corresponding to the interest-minimizing allocation of debt. On the basis of our assumed values, equality of marginal debt revenues and thus interest-minimization occurs at a level of liquidity (bank borrowing) of $8,545 million and interest costs of $495 million. Movements down the L_1 curve describe the relationship between reduced sales of issues to the banks and increased levels of interest cost. Let us say that the desired volume of debt revenues of $10 billion are signified by the R_1 curve of Diagram 2. Movements down the L_1 curve are then another way of looking at movements up the R_1 curve from A_1 in Diagram 2. As one moves up the R_1 curve, it is intersected by higher indifference cost curves implying that increased allocations to the nonbank public are associated with higher levels of interest cost. More than this, because of increasing marginal interest outlays on nonbank debt and because more units of nonbank debt are successively substituted for bank debt, given reductions in sales to the banks will be accompanied by increasing increments in interest costs. The curve L_1 is thus drawn convex from below. The

[11] The two different senses in which we shall employ the concept of liquidity should be pointed out. When we speak of the level of liquidity or the liquidity effects of issues, we shall be referring to the effects of debt operations on the money supply and/or the volume of money-substitutes. When used to suggest a quality of issues themselves, as for example, when we speak of highly liquid issues, the term liquidity will denote their ease of redemption without loss.

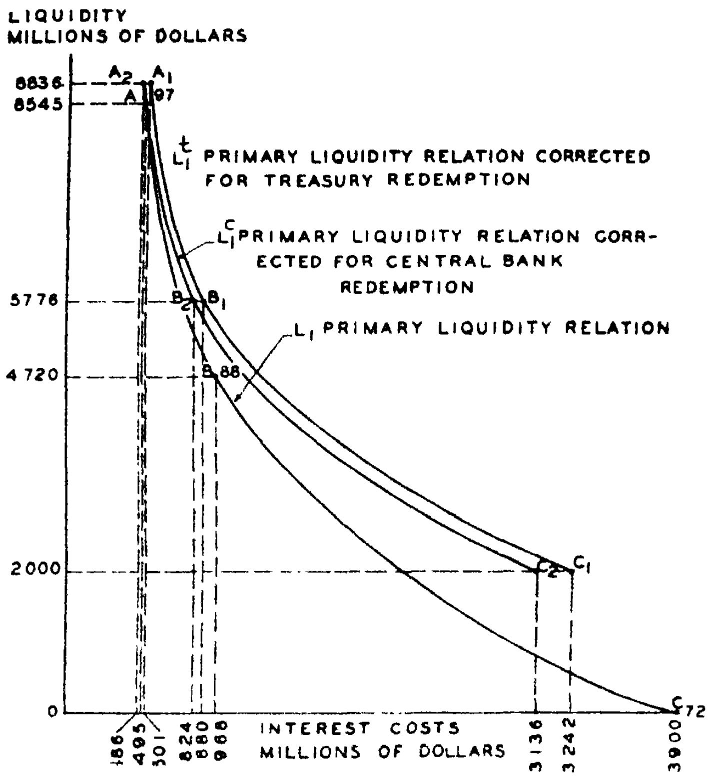


DIAGRAM 3. THE PRIMARY LIQUIDITY RELATION CORRECTED FOR TREASURY AND CENTRAL BANK REDEMPTION OF NONBANK ISSUES

degree of convexity depends on the relative elasticities of bank and nonbank demand. The more elastic the nonbank demand curve relative to the bank demand curve, the steeper the relation will be. At its extreme right, the curve ends up at the horizontal axis, indicating zero sales to the banks at interest costs of $3,900 million.

The issues sold to the nonbank public have a high degree of liquidity because of their assumed redeemability on demand either at the central bank or the Treasury. The actual redemption of issues will have both an interest-cost and liquidity effect. These effects will differ depending on the agency of redemption. We shall explore them beginning first with redemption at the Treasury.

The Primary Liquidity Relation Corrected for Treasury Redemption of Nonbank Issues. Each point on the primary liquidity relation (L_1) indicates not only the money- and interest-cost effects of a given debt allocation but also specific security prices for bank and nonbank debt. We shall derive the liquidity relation corrected for Treasury redemptions

by determining the volume of redemptions at certain selected security prices and calculating their monetary and interest-cost effects.

Let us begin with the security price of \$97 for nonbank issues (and \$95 for bank issues). These are the prices for the interest-minimizing liquidity point A on L_1. For at these security prices, marginal debt revenues will be the same on nonbank debt (\$95) as on bank debt.

Let us now assume (quite arbitrarily) that 20 per cent of the issues sold to the nonbank public at any given security price will be presented for redemption at the Treasury. The effect of such redemptions when sales are initially made at \$97 is for \$291 million of bank borrowing to be substituted for nonbank borrowing with a net increase in interest costs of \$6 million. For if desired debt revenues are to be maintained by the Treasury, the latter will now have to borrow from the banks in order to redeem the nonbank issues presented for redemption. The resultant corrections for the effects of Treasury redemption are shown by the A_1 point on the L_1' relation. In similar fashion we can derive points B_1 and C_1. The latter point lies to the left of the corresponding point on L_1 because as soon as the price of nonbank issues falls below that of bank issues, the redemption of nonbank issues at the Treasury results in an increase in the money supply but a decrease in interest costs.

The Primary Liquidity Relation Corrected for Central Bank Redemption of Nonbank Issues. In treating the alternative possibility of nonbank redemption at the central bank, we assume that at any given security price the volume of redemptions at the central bank will be similar to the volume of Treasury redemption when the latter is the agency of redemption. These redemptions should have exactly the same monetary effect as redemptions at the Treasury. Instead of the Treasury issuing substitute amounts of debt to the commercial banks, the central bank will be monetizing equal amounts of nonbank debt by its purchases. The effect of central bank redemptions should then cause the liquidity points A, B, C, and L_1 to move up to the same level as that of A_1, B_1, C_1 respectively on L_1'.

The interest-cost effects of central bank redemptions should be quite different, however. Under Treasury redemption, interest costs on the redeemed nonbank debt are, of course, cancelled. But this decrease in interest costs is offset by the increase in interest costs on the substitute debt sold to the commercial banks. Thus, for example, at A_1, interest costs on the nonbank debt declined by \$9 million as a result of Treasury redemption. But the substitute bank debt increased interest costs on commercial bank debt by \$15 million. As a result, point A_1 on L_1' showed a \$6 million net increase in interest costs as compared with point A.

Under most arrangements, the earnings of the central bank can be assumed to revert in substantial part to the Treasury. The interest costs on nonbank debt redeemed by the central bank are thus in effect cancelled also.[12] At the same time, since the central bank rather than the Treasury has redeemed these nonbank issues, it is unnecessary for the latter to sell additional amounts of debt to the commercial banks in order to maintain desired revenues. The essential difference between central bank and Treasury redemption is then the saving of interest costs on substitute commercial bank debt when the central bank is redeeming issues. Points A_2, B_2, C_2 on L_1^c (which is L_1 corrected for the effects of central bank redemption) lie directly to the left of A_1, B_1, C_1 by the amounts of these savings. In Diagram 3, they are to the left by $15 million, $56 million, and $106 million, respectively.

If we were to change one of our original assumptions and assume that the Treasury could borrow directly from the central bank when it (the Treasury) redeemed nonbank issues, the dissimilarities between the two cases of central bank and Treasury redemption would disappear.[13]

We might think of the corrected primary liquidity relations as the Treasury "housekeeping" relations. For they are of immediate significance to the Treasury, indicating the true costs to the Treasury of different initial bank-nonbank allocations. Such housekeeping relations do not reveal the entire story about the monetary effects of alternative allocations. For there are additional monetary effects from possible bank expansion, from nonbank purchase and holding of issues, and from interest costs themselves. The relation now to be developed, since it attempts to comprehend all liquidity effects, can be called the "over-all relation."

The Over-all Relation

We shall now assume that all redemptions take place at the central bank. We have thus reproduced in Diagram 4 the L_1 and L_1^c relations of Diagram 3. The first additional monetary effect results from excess reserves automatically provided the commercial banks by redemption of nonbank issues at the central bank. These excess reserves will be less than the amount of nonbank redemptions because of the the concomitant increase in required reserves or cash withdrawals. If we make the assumption that monetization of nonbank issues takes the form of

[12] While not strictly correct, we shall for purposes of simplicity assume that gross central bank earnings from government debt revert to the Treasury.

[13] Or alternatively, if we assumed that interest earnings of central banks were true costs to the Treasury, differences between our corrected relations would again vanish.

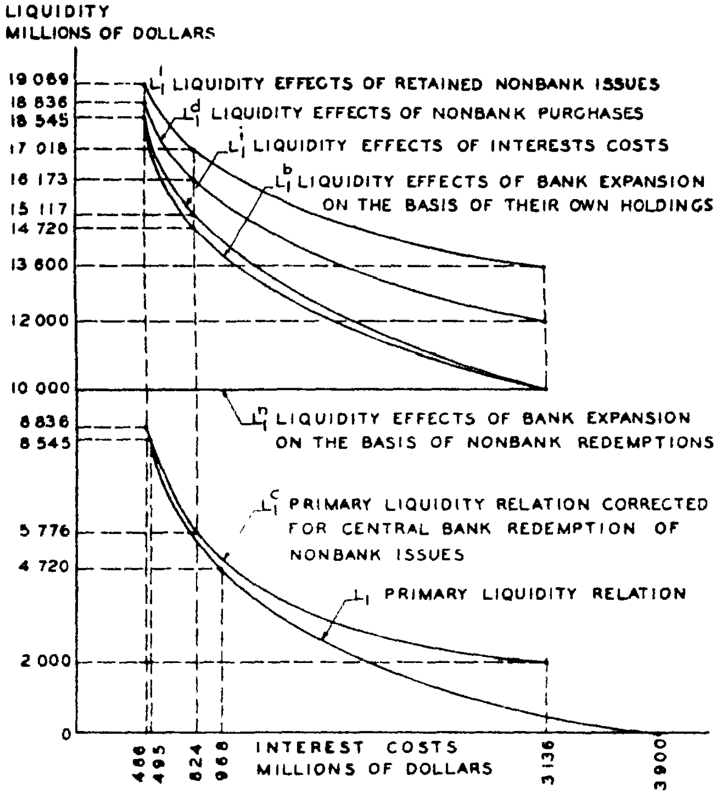


DIAGRAM 4. THE OVER-ALL RELATION

deposit liabilities, and that reserve requirements are 20 per cent, every $100 of nonbank redemption will provide the commercial banks with $80 of excess reserves. At minimum interest costs of $486 million, the associated volume of nonbank redemptions will be $291 million.[14] The resultant increase in excess reserves will be $232.8 million. Assuming a coefficient of bank expansion of 5, the potential amount of assets that can be acquired by the commercial banking system on the basis of these excess reserves will be $1,164 million. Adding this amount on to the $8,836 million shown at A_1 we secure the first point on the new L_1^n relation which thus begins at $10,000 million. In similar fashion we can derive the two other values shown on this relation. The horizontal slope of this relation is explained by our assumptions. Twenty per cent of initial nonbank allocations multiplied by the coefficient of expansion

[14] All monetary effects from given bank-nonbank allocations will be plotted at the corrected levels of interest cost as these were arrived at in the preceding section on central bank redemption of nonbank issues

of 5 will always give us a value equal to these initial nonbank allocations. Superimposing these values on initial allocations to the banking system must necessarily give us values equal to desired debt revenues of $10 billion.

As the next stratum in monetary effects, we must consider the redemption by the commercial banks of their own initial holdings of governments. We shall again (arbitrarily) assume that 20 per cent of their holdings will be redeemed at the central bank for the purpose of further asset expansion.[15] At the interest level of $486 million, a 20 per cent redemption will amount to .20 times $8,545 million or $1,709 million.[16] Assuming again a bank coefficient of expansion of 5, total possible asset acquisition could be $8,545 million. The L_1^b relation cumulates this amount onto the previous $10,000 million and thus begins at $18,545 million. The steep slope of this relation when other values are plotted is explained by the diminution in commercial bank purchases and thus in potential excess reserves as we proceed to the right on the diagram.

Interest costs may exert a monetary effect in themselves. These are suggested by the L_1^i relation. As allocations to the nonbank public increase beyond the interest-minimizing allocation, the level of interest costs will rise. If such increases in interest costs are not financed by taxation, the desired level of debt revenues must increase beyond the level implied by the primary liquidity relation. In such a case, bank borrowing may also increase.

Let us assume that the corrected minimum interest cost level of Diagram 4—$486 million—can be financed out of taxation (or desired revenues of $10 billion). Interest costs in excess of this amount will either have to be financed out of taxation or borrowing. We shall assume that half of the excess in interest costs is financed by borrowing and that this borrowing is divided between bank and nonbank sources in the same proportion as initial bank-nonbank allocations. The problem entailed by the fact that extra borrowing will have interest costs of its own will be circumvented by assuming that they too are financed by taxation.

On this basis the new liquidity relation begins at $18,545 million at interest costs of $486 million. At interest costs of $824 million, the

[15] These redemptions will be over and above the redemptions necessitated by the initial bank purchase of governments. Such purchases would increase the deposit liabilities of the banks or their currency withdrawals. In either case, the commercial banks would find it necessary to cash in some of their governments

[16] The redemption of bank issues at the central bank should reduce true interest costs just as nonbank redemptions did. The L_1^i relation should thus begin to the left of the L_1^n relation. For simplicity's sake, however, we shall ignore this shift in the relation and assume that it also begins at $486 million.

excess of interest costs amounts to $338 million half of which is assumed to be financed by borrowing. At this level of interest cost, approximately 47 per cent of initial Treasury borrowing was from the commercial banks. Applying this percentage to $169 million and multiplying it by the coefficient of expansion of 5 gives us total possible monetary effects of $397 million. Superimposing this on the L_1^b value of $14,720 million, results in the plotted value of $15,117 million. In a similar way, other values can be arrived at.[17]

Purchases by the nonbank public have liquidity effects apart from the effects of redemptions. Such purchases may be financed out of idle cash balances or out of funds borrowed from the banking system. The L_1^d relation assumes that 20 per cent of nonbank purchases will be financed in these ways. In order to cumulate this liquidity effect onto the others already discussed we shall assume that a reduction in idle cash balances is equivalent in economic effect to an increase in the actual money supply and can thus be treated in the same fashion. The liquidity axis should then be interpreted as measuring both increases in the actual money supply and decreases in idle cash balances. On this basis the L_1^d relation begins at $18.836 and terminates at $12,000 million.

Issues retained by the nonbank public and not redeemed will exert a liquidity effect of their own. The moneylike quality of such issues may encourage the nonbank public to hold smaller amounts of idle cash balances. We shall assume that each $100 of retained nonbank issues results in a $20 decrease in holdings of idle balances. We thus calculate 20 per cent of retained nonbank issues at the selected interest cost levels in order to arrive at the L_1^l relation. This can also be regarded as the "over-all relation" since it has cumulated all the previous relations.

The height and slope of our over-all relation has been determined by the assumptions we have made about the relative elasticities of bank and nonbank demand, the ratios of bank and nonbank redemptions to initial purchases, the coefficient of bank expansion, the percentage of increases in interest cost financed by bank borrowing, the per cent of nonbank purchases financed by new money, and the cash-balances effect of purchasing and retaining nonbank issues. These are, of course, wholly arbitrary assumptions without empirical basis. Variations in them will produce an unlimited number of relations. The greater the elasticity of nonbank demand and the amount of banks' redemption of

[17] An alternative assumption would have considerably more of a flattening effect on the L_1^c relation If half of the increases in interest costs were financed by a fixed percentage of bank borrowing, monetary effects would increase with increases in interest costs rather than decreasing.

their own holdings and bank asset expansion on the basis of the resultant reserves, the more negatively sloping will be our over-all relation. The greater the importance, on the other hand, of the monetary effects of interest costs, nonbank purchases, retentions, redemptions and bank expansion on the basis of the resultant increases in reserves, the more nearly positive or the more positively sloping will be the over-all relation.

While its proof may be more intuitive than empirical, we shall consider the over-all relation to be a downward sloping one, as suggested by our hypothetical example. The implications of such a relation seem more reasonable than the implications of a flat or rising relation. For a negatively sloping relation implies that a dollar of nonbank debt will have less over-all monetary effects than the dollar of bank debt for which nonbank debt is being substituted.

III. *Interest Costs and Liquidity: Departures from the Interest-Saving Model*

Illiquid Nonbank Issues

The Treasury will depart from the interest-saving model by offering illiquid issues to the nonbank public. Issues may still be more liquid than any other paper claim but the comparison is now with the "most liquid" type of governments. Neither Treasury nor central bank redemption will be assumed to be offered the nonbank public. Liquidity will now only be provided by the marketability of nonbank issues within the nonbank sector. Bank issues are still assumed to be redeemable on demand at the central bank.

The maturity lengths of securities now become of significance for the first time. Depending on the time to maturity, an illiquid nonbank issue will have more or less liquidity. Thus the nonbank demand curve should lie the farther to the left the longer the maturity of the issue sold.[18] If only a single maturity is offered the nonbank public in a given debt operation, there will be a unique primary liquidity relation for each alternative length of maturity. The longer the maturity, the farther to the right on a map of liquidity relations would the appropriate relations lie.

The lower terminal point of many (if not all) of these relations would possibly occur at some positive level of bank borrowing. Assuming the raising of the same volume of debt revenues as in the case of L_1 relation, the more limited demand for illiquid issues is likely to result in demand inelasticity and negative marginal debt revenues before the

[18] See our discussion of the nonbank demand curve, pp. 322-23 above

debt is entirely allocated to the nonbank public.[19] This will be increasingly true as maturities lengthen. We should thus visualize a series of relations, each beginning to the right of the previous relation but having a lower terminal point above and to the left of each of those representing a shorter maturity.

If now we were to remove the marketability feature of nonbank issues and assume that they are nonmarketable both within and without the nonbank sector, we should reach the ultimate in illiquidity. The term nonmarketability is used strictly and does not imply the option of redemption at the Treasury before maturity. With the exception of issues with very short maturities, such nonmarketable issues would probably be unsellable except at very low prices.

The offering of many different maturities in a given debt operation would probably result in a composite primary relation lying below any of the primary relations based on the offering of relatively illiquid issues in a single maturity only. For the broadening of the nonbank market for debt by the offering of many maturities would lower the average yield (raise the average issue price) for any given amount of nonbank borrowing. In this way, the aggregate interest costs associated with a given level of money creation (bank borrowing) should be lowered. We shall refer to this composite primary relation as the "L_2 relation."

A composite relation will impose certain restraints on the security prices offered by the Treasury. These various maturities for marketable issues would have market prices. We would anticipate some regularity in the relationship of market yield (market price) and maturity. If long-run interest expectations are for rising rates, this would result in a "Treasury yield curve" which rose with length of time to maturity. Or (apart from interest expectations), if there is a preponderance of demand from investors wishing to maintain a high degree of liquidity the yield curve would be a rising one. The Treasury will then have to be mindful of the market pattern of rates when it sets a price on a given maturity. Variations in one security price will require consistent variations in those for other maturities as well.

There can be an indefinite number of L_2 relations since at alternative patterns of rates the Treasury may limit its sale of certain maturities. Thus it may offer as many long-terms as it can hope to sell but underallot short-term issues. Each weighting of maturities will produce its distinctive interest-cost level for given amounts of bank-nonbank borrowing and thus its own distinctive liquidity relation.

[19] The likelihood of negative marginal debt revenues before the debt is entirely lodged with the nonbank public is increased by the sale of illiquid rather than liquid issues in the same way that this likelihood is increased by increases in the volume of desired debt revenues (see footnote 9, above).

It is of some importance to decide how the primary and over-all relations based on illiquid nonbank issues compare with those based on liquid issues. Certainly we should expect the L_2 primary relation to lie above and to the right of the L_1 relation. For the composite demand curve for illiquid issues of various maturities would lie to the left of the demand curve for a perfectly liquid issue on the basis of which the L_1 relation is constructed.

It is possible, however, that the *demand to hold* securities may be the same whether liquid or illiquid issues are sold. Allowing for the redemptions made possible by liquid issues (and which by assumption are not possible for illiquid issues), the demand curves to hold may be identical or be greater for illiquid issues. Just how the nonbank demand to hold for illiquid issues compares with the demand curve to hold for liquid issues has been a major issue in debt management. In Section IV of this paper we shall indicate some of the arguments that have been advanced for and against there being a greater demand to hold for illiquid issues.

Illiquid Bank Issues

As our next departure from the interest-saving model, let us consider the implications of variations in the liquidity of bank issues. Up until now, they have been assumed to be redeemable on demand at fixed prices at the central bank. They were thus equivalent to legal reserves. Let us now assume that bank issues provide only an eligible collateral for loans from the central bank. Given an aversion to central bank borrowing and its direct variation with the amount of bank borrowing, the bank demand curve might shift to the left and depart from perfect elasticity. It would probably begin at some higher interest yield than the previous bank demand curve and become progressively less elastic. The essential modifications in our liquidity relations would not appear to be substantive ones, however. Assuming the same alternative types of nonbank issues, the primary liquidity relations should now begin at lower levels of money supply and higher levels of interest cost. The reason for this is that modifications in the bank demand curve will result in minimum interest costs being associated with larger allocations to the nonbank public and higher rates of interest on both bank and nonbank debt. The new liquidity relations should continue downward and to the right of the former relations. The relations involving illiquid nonbank issues should terminate at the same level of liquidity as for the primary L_2 relation but at higher levels of interest cost. In the case of liquid nonbank issues, the liquidity relation should have the same terminus as L_1. For at zero sales to the banks (as this terminal point implies) the assumed increases in bank interest costs will be ineffective.

This revised relation will then be shorter and steeper than the former L_1 relation.

We have now discussed the major choice confronting the Treasury in choosing a liquidity relation. It may emphasize the sale of liquid issues or it may stress illiquid issues. In addition, there is the question of just what liquidity point (interest structure) to select once a decision has been made about the liquidity relation. These issues have been extensively debated in recent years. In the next section we shall attempt to formulate this debate in terms of our analysis. This will also provide a convenient summary to our argument.

IV. *The Issues in Debt Management*

The Treasury was criticized for many years, down to the time of the famous "accord" with the Federal Reserve authorities in 1951, for selecting liquid issues and setting low rates on these issues. In terms of our analysis, it was criticized for selecting low-lying primary relations and choosing points up and to the left on these relations. It was suspected that these decisions were motivated by a concern for interest costs. As a consequence, debt management was said to have been responsible for undesirable liquidity effects.

The liquidity relations selected by the Treasury in this period can be described as a mixture of the two basic types of relations on which we have built our theoretical analysis. We can think of them as L_2 relations modified by some of the characteristics of the L_1 relations. Thus nonmarketable issues (then and now) have provisions for redemption at the Treasury at the option of the holder before maturity and thus have much of the liquidity of L_1' issues. They are not completely liquid, however, because of the various waiting periods before redemption and the interest-rate penalties against early redemption. The marketable part of the debt may be viewed as L_2 issues having a high degree of liquidity because of fairly rigid support of the prices of marketable issues by the central bank.[20] We suggest the type of issues offered by the Treasury by the L_1 relation of Diagram 5

The rigid support given to market prices by the central bank tended in general to stabilize the market yield structure prevailing at the outset of the second world war. The liquidity point on a given liquidity relation is automatically selected when yields on new issues are set according to the prevailing structure of yields. Sales to the nonbank public are then determinate and so are residual sales to the banks. Total interest costs follow from this allocation and from the yields paid in the

[20] During the period under discussion, the degree of support underwent various modifications. Our analysis here and elsewhere will involve an obvious simplification of actual debt history.

two markets. We represent the money supply and interest-cost effects of the liquidity point selected by the Treasury by point A.

Our theoretical framework was constructed on the basis of a single debt operation. Redemptions at the Treasury or the central bank were assumed to be a portion of issues sold during the same debt operation. More realistically, in the course of a given debt period, issues sold in previous debt operations may be presented for redemption at the Treasury or sold to the central bank. The moving up of liquidity relations as a result of the unloading of "old" issues will probably be more significant than the moving up effects of redemption or sale of new issues. This is increasingly true as the debt outstanding grows and comes to constitute an ever larger multiple of the current debt operation. Certain inherent contradictions resulting from the mixing of L_2 and L_1 features tended to increase the rate of redemption of old marketable issues in the period under consideration. Unqualified central bank support was given to a term-structure of yields which rose with time to maturity. This encouraged the sale to the central bank of long-term issues as their term to maturity shortened. Moreover, bank and nonbank markets were not rigidly stratified. This resulted in nonbank holders "free-riding" by selling issues to the commercial banks whose purchase the banks had originally financed.

The sale of liquid issues runs the risk of some outside shock occurring which will precipitate a wholesale unloading by the nonbank public. For a considerable period after issues are sold, there may be a strong demand to hold issues. But once higher prospective returns develop in other markets, nonbank holders will be tempted to redeem issues acquired in past and current debt operations. This is indeed what happened in the postwar period. The L_1^{c+t} relation of Diagram 5 suggests the resultant moving up of the primary relation. The fact that liquid issues quite possibly postponed monetary effects until the end of the war, was not regarded by critics of debt management as an adequate defense of low-lying primary relations in the war period. It was just in the postwar period that a containment of liquidity effects was most necessary and desirable.[21]

As would be suggested by our framework, the moving up of the primary relation exerts an opposite effect on interest costs and money creation. The yields paid by the Treasury on nonbank debt exceeded those paid on bank debt. The sale (redemption) of nonbank issues resulted in either increased holdings by the central bank or substitute borrowing from the commercial banks. In either case, true interest costs must have declined. The liquidity point A thus moved upward to the

[21] *Cf* Woodlief Thomas, "Lessons of War Finance," *Am. Econ. Rev.*, Sept. 1951, XLI, 628.

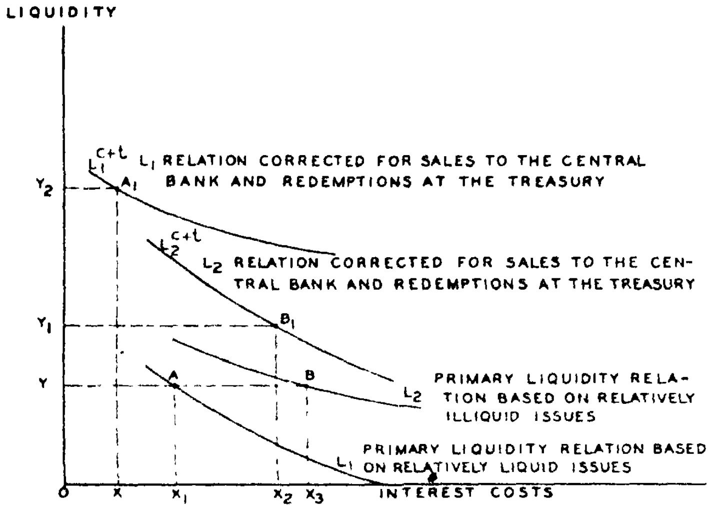


DIAGRAM 5 TWO ALTERNATIVE DEBT POLICIES COMPARED

left[22] to a position such as suggested by A_1 on L_1^{c+t}. It would seem possible, then, that the Treasury selected liquid issues because of the interest-saving effect of nonbank redemptions. This is not likely, however. The Treasury could have secured the A_1 level of interest costs more directly by selling illiquid issues to the nonbank public thus forcing itself to borrow larger amounts from the banking system. A more reasonable hypothesis would seem to be that the Treasury selected a low primary liquidity relation in order to reduce effects on the money supply within the limits set by the prevailing yield structure. Since the primary relations are downward sloping, it is of course true that selection of a low primary relation also meant that interest costs were simultaneously being reduced for the selected level of liquidity. Interest costs were not being absolutely minimized, however. The interest-saving intentions of the Treasury are perhaps most clearly revealed by its adherence to the prevailing market structure when it conducted intensive borrowing operations. If it had not adhered to this structure it could have moved even farther down the selected relation and have been responsible for even smaller increases in the money supply. That this was not done is

[22] The only exception to this results from imperfect stratification of bank and nonbank markets. When the nonbank public sold its holdings to the commercial banks, the monetary effect was present without the interest-cost effect. To this extent the A liquidity point moved straight up rather than to the left. The same would be true of any other liquidity point, except that liquidity points indicating initially higher yields on bank than on nonbank debt would now move straight up instead of moving to the right. The removal of stratification is thus analogous in its effects on the liquidity relation to that of Treasury redemption as compared with central bank redemption of nonbank issues only in a more decided way. (See Diagram 3.)

probably explained by an aversion to higher levels of interest cost.

Failure to proceed farther down the relation made this saving of interest more apparent than real, according to some critics.[23] For the liquidity points selected so increased the money supply that the price level was bound to be affected. The Treasury in succeeding operations thus was compelled to increase its money borrowing in order to finance a given level of real expenditure.[24] The relevant primary liquidity relation would move to the right. Maintenance of the same yield structure on new borrowing or refunding operations would then require higher interest costs as well as greater initial amounts of bank borrowing.[25] Treasury interest costs might have been lower in the long run, according to these criticisms, if less liquid issues had been used and higher yields had been paid.

Those who wished to restrict the monetary effects of Treasury debt operations would have selected a primary liquidity relation of the type suggested by L_2 in Diagram 5. The subscript indicates that it would have been more closely akin to the L_2 relation of our theoretical analysis than to the L_1 relation. Of the many possible variants of composite L_2 relations, it would probably have weighted long-terms more heavily than short-terms. Its initial distance above the L_1 relation of Diagram 5 is explained by the relative illiquidity of the issues offered. Many degrees of illiquidity could have been offered in the place of rigid support. There could have been support with adjustable "pegs," market stabilization, or just sufficient support to maintain orderly markets.[26] Orderly markets would have called for the stabilizing of key issues for uncertain durations. Finally, there could be complete illiquidity which would obtain if the central bank not only failed to support securities at any

[23] See, for example, Lester V. Chandler, "Federal Reserve Policy and the Federal Debt," *Am. Econ. Rev*, Mar. 1949, XXXIX, 427.

[24] Under certain circumstances it is conceivable that desired debt revenues would not increase. Price-level increases would raise the level of money national income. Tax receipts would then rise If the income elasticity of tax receipts were sufficiently high, desired debt revenues would actually decrease. For this to happen, however, the income elasticity of tax receipts would have to exceed the income elasticity of government expenditures by at least the initial ratio of government expenditures to taxes This follows from the necessary excess of government expenditures over tax receipts for there to be a deficit in the first place. With a given change in money national income then, the same percentage change in taxes and expenditures would actually result in a greater absolute change in expenditures and thus a greater deficit.

[25] The extent to which bank borrowing and interest costs respectively increased would depend on the repercussions of a higher money national income on the nonbank demand curve for governments. The greater the increase in demand, the greater the increased allocation to the nonbank public at prevailing yields and the greater the increase in interest costs and the smaller the increase in necessary bank borrowing.

[26] *Cf* Robert V. Roosa, "Integrating Debt Management and Open Market Operations," *Am. Econ. Rev.*, Proceedings, May 1952, XLII, 218 ff.

time but even took the selling side of the market when inflationary circumstances warranted it.[27]

Let us assume that central bank support would be limited to the provision of orderly markets. This might be taken to mean the supporting of market yields at approximately the level of yields offered on new issues. As yields were increased on new issues under the proposed policy, prices of outstanding issues would fall away from their issue prices. Nonbank holders could only shift out of debt and into cash by taking a capital loss on their holdings. In addition, the effect of increasing yields might deter sales to the central bank by generating a vague uncertainty. If the private yield structure should be "sticky," the advantages to lenders of cashing in their holdings for the purpose of alternative investment would also be reduced.[28]

For these reasons, the moving-up of the L_2 relation was expected to be much less substantial than the moving up of the L_1 relation. Some moving up in the L_2 relation was probably regarded as inevitable. Certain nonbank holders of marketable issues would be willing to take capital losses. Holders of nonmarketable issues might actually be encouraged to redeem as market yields rose. But on the whole, holders of marketable issues were expected to be deterred from shifting out of debt.

The higher the level of yields offered on new issues, the greater would be potential capital losses and thus the greater would be the locking-in of outstanding issues. Thus the farther down on the L_2 relation that the selection of the liquidity point was made, the smaller would be the moving-up effects. For this reason the L_2 relation corrected for nonbank redemptions and sales to the central bank—L_2^{c+t}—is drawn as a steeper relation than L_1^{c+t}.

The payment of higher yields as suggested by the critics of debt management might have taken the form of selecting a liquidity point such as point B on the L_2 relation. It represents the same initial allocation between the banks and the nonbank public as was secured by the use of the A liquidity point. The sale of the same dollar volume of debt to the nonbank public when illiquid rather than liquid issues were offered would necessarily require the payment of higher yields. The limited moving-up of this point as a result of illiquidity and higher yields is suggested by B_1 on L_2^{c+t}.

If the proposed policies were effective, they would have reduced the volume of excess reserves automatically made available to the banks

[27] Statement of Milton Friedman, *Hearings before the Sub-committee on General Credit Control and Debt Management, Joint Committee on the Economic Report, 82nd Cong., 2nd sess., March 10-31, 1952* (Washington, 1952), p. 688; Milton Friedman "Comments on Monetary Policy," *Rev. Econ Stat.*, Aug. 1951, XXXIII, 186 ff.

[28] *Cf.* James Tobin, "Monetary Policy and the Management of the Public Debt: The Patman Inquiry," *Rev. Econ. Stat.*, May 1953, XXXV, 122.

whenever the nonbank public sold issues to the central bank. Restrictive policies were also aimed at curbing bank expansion of credit on the basis of the banks' own holdings of governments. This would have been done by removing support prices from bank issues as well as nonbank issues and by offering increased yields on new issues. If private yields showed rigidity, this would have been an additional factor reducing the attractiveness for banks of cashing in their holdings. By lowering reserve requirements or through limited open-market operations it would still be possible to have banks play the role of residual lender to the Treasury.

In sum, the proposed policies would have attempted to minimize the over-all liquidity relation and to choose a satisfactorily low level of liquidity on this relation by substituting relatively illiquid bank and nonbank issues for liquid issues and by paying higher yields. According to one school of thought, relatively small increases in yields combined with only the provision of orderly markets for securities, would have had the effect of securing substantial reductions in the money supply.[29]

It is not certain, however, that these policies would have succeeded. For it is possible that rising yields would have occasioned expectations of further increases and thus have encouraged sales to the central bank despite the incurrence of capital losses. Uncertainty and confusion might have disappeared after the market had adjusted itself to flexibility. The private yield structure may be much less rigid when the employment of devices equivalent to higher interest rates is considered.[30] As a result, the over-all liquidity relation based on relatively illiquid issues might have been above one based on liquid issues. While higher yields would have had the effect of moving-down the over-all relation, if the moving-up effects of illiquid issues had been substantial enough, the over-all level of increase in the money supply could have exceeded the level based on lower yields on liquid issues. The period after the Treasury-Federal Reserve accord offers a somewhat limited test of this issue. For the subsequent modifications of policy were relatively moderate.[31] And yet, in the twelve-month period after the accord, the increase in the money supply greatly exceeded the increase for approximately nine months before the accord.[32] Analysis of this increase would indicate that slightly falling market yields did not succeed in locking-in the nonbank holdings of life insurance companies and other major in-

[29] *Ibid.*, pp. 122-24.

[30] *Loc. cit.*

[31] *Cf. Report of the Subcommittee on General Credit Control and Debt Management of the Joint Committee on the Economic Report, 82nd Cong., 2nd sess.* (Washington, 1952), pp. 16-18; Henry C. Wallich, "Recent Monetary Policies in the United States," *Am. Econ. Rev.* Proceedings, May 1953, XLIII, 36.

[32] *Report of the Subcommittee, op. cit.*, pp. 16-18.

stitutional holders.[33] Nor did they prevent a considerable expansion in bank loans and investments although this expansion was related to variations in the monetary gold stock rather than to central bank absorption of governments.[34]

It would be maintained by some that issues were not made sufficiently illiquid and that yields did not advance high enough to curb monetary effects. To curb increases in the money supply, interest rates should advance just as far as is necessary to achieve the desired reduction without any consideration at all to the effect on the prices of government securities.[35] Primary liquidity relations which began far to the right and liquidity points far to the right on these relations would have been selected if necessary under this policy. Desired debt revenues could then have been largely secured from the nonbank public without any moving-up effects.

Implicit in this analysis is some assumption about the lower terminus of liquidity relations based on illiquid issues. It is apparently assumed that the L_2 relations will terminate at the horizontal interest cost axis or close to this axis. In this way, desired debt revenues could be secured in the main from the nonbank public as long as the Treasury were willing to pay the necessary interest return. It is possible, however, that the selecting of highly illiquid issues would result in relations that not only began far to the right but terminated at positive levels of bank borrowing. Negative marginal debt revenues might make it impossible to lodge most of current borrowings or refundings with the nonbank public.[35a] In this way residual allotments to the banking system would be increased. The failure of the relation to move up would be somewhat neutralized by the higher initial allocations to the banking system that it made necessary.

If we grant the implicit assumption that the primary liquidity relations for illiquid issues will terminate close to the horizontal axis, then another difficulty would seem to present itself. Extensive movements to the right, if necessary to curb monetary effects, would cause interest costs to increase sharply. If no weight is given to such interest costs then the argument would seem to be a logical one. But interest costs

[33] Statement of C. R. Whittlesey, *Hearings before the Sub-committee on General Credit Control and Debt Management*, *op. cit.*, pp. 699 ff.

[34] *Ibid.*, p. 710.

[35] Friedman, "Comments on Monetary Policy," *op. cit*, p. 187; *Hearings*, *op. cit.*, p. 732.

[35a] Our analysis would apply even if securities were always sold at par. Although marginal debt revenues would always be the same positive value in this case—equal to the par value of the security—marginal interest outlays would increase with increased allocations to the nonbank public because of increasing nominal interest rates. As a result, at some allocation of debt, marginal interest outlays might exceed marginal debt revenues. The sale of additional nonbank debt at par would then cost more in terms of annual interest costs than such debt would bring in. This would be a similar situation to negative marginal revenues in the sale-below-par case.

do have economic effects apart from the "housekeeping" problems they entail for the Treasury. Interest costs may exert incentive and distributional effects because of the tax payments they occasion. Distributional effects should allow for the increased transfers vis-à-vis the private debt occasioned by higher levels of public interest cost. Unless given reductions in the money supply were always "worth," in terms of their economic effects, increasing increments in interest costs,[36] the optimum liquidity point would obviously not be the same point as when this is determined by consideration of the economic effects of liquidity only.

In view of these questions, rational debt management would seem to require more information than is presently available. We would have to know the various over-all relations yielded by the various alternative types of primary relations. We would have to know the economic effects of liquidity and interest costs respectively. This would involve knowing the relationship between variations in the money supply and the price level[37] and the economic effects of changes in the price level. We would also have to know the alternative distributional effects of alternative allocations of debt between the bank and nonbank public. Only when we had such knowledge would it seem possible to select that primary relation and that structure of yields that best approximated the optimum liquidity point.

The problem of policy is also complicated by questions of feasibility of schemes of direct control of monetary effects. Thus supplementary reserve schemes in conjunction with relatively liquid issues might tend to depress the over-all relations as compared with relations based on less or wholly illiquid issues without such controls. For it might then be possible to depress the primary liquidity relations by offering liquid issues at the same time that the significant moving-up effects of bank expansion were being curtailed. The optimum liquidity point would doubtlessly be quite different under these circumstances.

The need for greater knowledge about the effects of alternate policies has probably abated in recent years because of a weakening of inflationary pressures. The problems of debt management are likely to be most acute in periods of inflation. At such times, the selecting of liquidity points to the left on the liquidity map will be criticized for their over-all liquidity effects. In periods of relative stability or recession, on the other hand, low interest costs and high liquidity may both be quite desirable objectives.

[36] It is of course entirely possible that this should be so. But so far it would not seem to have been proven or disproven by empirical analysis.

[37] The short-run relationship between variations in the money supply and the price level was much debated after the postaccord experience of considerable price stability (*cf.* statement of C. R. Whittlesey, *op. cit.*, pp. 708-9; *Hearings, op. cit.*, pp. 715 ff; *Report of the Subcommittee, op cit.*, p. 19).

A GENERAL EQUILIBRIUM ANALYSIS OF EXCISE TAXES

By PAUL WELLS*

This paper will present a theory of the incidence of both the burdens and benefits an excise tax exerts in a two-person, two-factor, two-commodity, perfectly competitive world.[1] Although this attempt may appear to be unnecessarily modest, excise tax theory should be clear on this first step before additional complicating considerations are introduced to make the analysis more realistic. The main conclusions of this paper are: (a) that an excise tax exerts both a burden—an aspect of excise taxes long recognized and much discussed in the literature[2]—and a benefit, an aspect of excise taxes that has been little discussed in the literature; and (b) that these burdens and benefits fall on individuals as buyers and sellers of goods and services, and that the degree to which the burdens and benefits of an excise tax spread out from one individual or group of individuals to another individual or group of individuals will depend upon the preference functions of all individuals, the asset structure of all individuals, the tax and expenditure policy of the taxing agency, and the nature of the transformation functions of the commodities produced. We shall demonstrate these conclusions for our two-dimensional world, and then consider how far it is possible to go in generalizing from it.

* The author is a graduate student in economics at Stanford University. He is indebted to Dr. John Fei, Massachusetts Institute of Technology, and to Professor Elmer D. Fagan, Stanford University, for helpful suggestions concerning the analysis contained in this paper.

[1] Recent attempts, along much different lines from the one to be followed in this paper, to subject incidence theory to a general equilibrium analysis have been made by E. R. Rolph, "A Proposed Revision of Excise-tax Theory," *Jour. Pol. Econ*, Apr. 1952, LX, 102-17, and "A Theory of Excise Subsidies," *Am. Econ. Rev*, Sept. 1952, XLII, 515-27; R. A. Musgrave, "On Incidence," *Jour. Pol. Econ.*, Aug. 1953, LXI, 306-23, and "General Equilibrium Aspects of Incidence Theory," *Am. Econ. Rev.*, Proceedings, May 1953, XLIII, 504-17; J. A. Stockfisch, "Excise Taxes: Capitalization-Investment Aspects," *Am. Econ. Rev.*, June 1954, XLIV, 287-300. See also J. F. Due, "Toward a General Theory of Sales Tax Incidence," *Quart. Jour. Econ.*, May 1953, LXVII, 253-66.

[2] *Cf.* F. Y. Edgeworth, "The Pure Theory of Taxation," *Econ. Jour.*, Mar. 1897, VII, 46-70; A. Marshall, *Principles of Economics*, 8th ed. (New York, 1949), pp. 413-15; E. D. Fagan, "Tax Shifting and the Laws of Cost," *Quart. Jour. Econ.*, Aug. 1933, XLVII, 680-710, and the literature there cited.

I. *The General Equilibrium Model*

In formulating the General equilibrium model to be used,[3] we need, in addition to the assumptions usually required by perfect competition, the following assumptions: (a) Two people, a farmer called A and and a worker, B; (b) Two factors of production: land and labor, fixed in supply and completely owned by A and B; (c) The ratio of land to labor owned by A exceeds the land-labor ratio of the economy;[4] (d) Two products: food and clothing, each of which requires the use of both land and labor for its production; (e) The production functions for food and clothing are homogeneous and of the first degree; (f) The production of food is a relatively land-intensive industry and the production of clothing a relatively labor-intensive industry.

With these assumptions, we can develop the following functions:

1. A production-possibility function between food and clothing (PP' in Figure 1).

2. A division-of-output function (KL). This function states the ratio in which output is divided between A and B for all possible output combinations to be found in PP', and can be used to show the degree to which the division of output between A and B changes as a consequence of, say, the levying of an excise tax on one of the two commodities. If we let the radial line OJ_1 be an index of output J_1, then the intersection of the KL function with this index states the ratio OD_1/D_1J_1 in which output J_1 will be divided between A and B in payment for the services of land and labor given up to the productive sector by A and B, with OD_1 of OJ_1 output going to A and the remainder, D_1J_1, going to B. From the shape of the KL function we notice that A's share of output increases, and B's decreases, as more food and less clothing are produced. This follows from assumptions (c) and (f). Assumption (f) requires the price of land to rise relative to the price of labor as more food and less clothing are produced; and, as a consequence of assumption (c), A's share of output will increase and B's decrease. The curvature of KL at, for example, any point D_1—that is, the degree to which the division of output would change as a consequence of a small change in the pattern of output from that shown by J_1—depends upon: (a) the absolute difference in the proportions in which the two factors are combined, respectively, in the two industries when the output is J_1. The greater this difference is, the greater must be the change in relative factor prices to effect a given change in output, and hence, the greater will be the change in the division of output between A, the owner mainly of land, and B, the owner mainly of labor.

[3] The model used was originally conceived of by J. Fei, and jointly developed by Fei and the author.

[4] The ratio of land to labor owned by B will necessarily fall short of the land-labor ratio of the economy.

(b) The difference in the ratio of land to labor owned by A and B. The greater is this difference, the greater will be the change in the division of output between A and B that will result from a small change in the pattern of output from J_1. The position of KL with respect to the origin depends upon the absolute amounts of land and labor owned, respectively, by A and by B. The more of both factors A owns, the farther out from O will KL be. Rather than develop the KL function rigorously—which is, at best, a tedious operation—we shall let this intuitive argument suffice.[5]

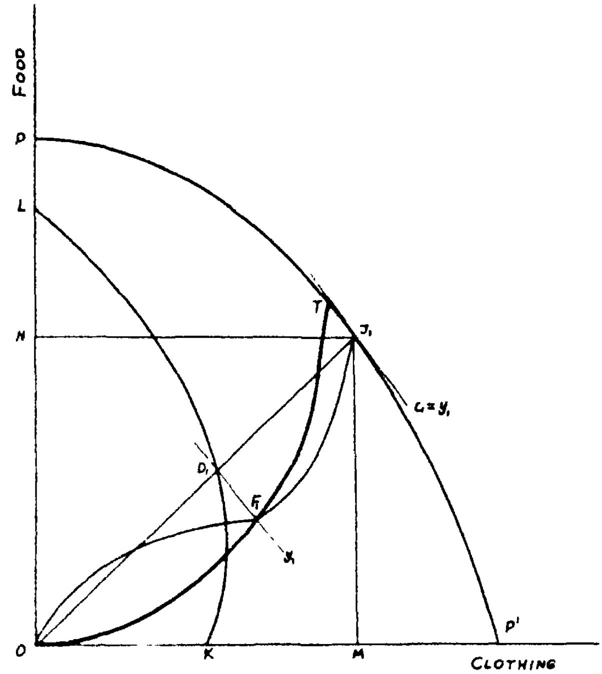


FIGURE 1

3. A specific contract curve (OF_1J_1 in Figure 1). This function is the locus of points for a particular output which satisfy the Paretian general optimum of exchange. For any possible output combination such as J_1 there is a box ONJ_1M "belonging" to that output. The dimensions of the box give the total amounts of food and clothing available for consumption by both A and B. If we place the origin of A's indifference map at O and the origin of B's map at J_1, then it is possible to define the locus of point such that it is not possible to increase the welfare of either A or B without reducing the welfare of either one or the other by a redistribution of the given output between the two. The

[5] For a somewhat different discussion of this relation, *cf.* W. F. Stolper and P. A. Samuelson, "Protection and Real Wages," *Rev. Econ. Stud.*, Nov. 1941, IX, 62-69 (also reprinted as Chapter 15 in *Readings in the Theory of International Trade*, ed. by H. S. Ellis and L. A. Metzler [Philadelphia, 1949], ff. 335-57).

locus is the Edgeworth contract curve. Since each point on PP' defines a consumption box and a specific contract curve there exists a family of specific contract curves, one for each possible output combination. An important characteristic of specific contract curves is that the slopes (marginal rates of substitution) at which the indifference curves of A's system are tangent to those of B's system are free to vary throughout the length of the specific contract curve.

4. A generalized contract curve (OF_1T). This function is the locus of points which satisfy the Paretian general optimum of both production and exchange for our model. We saw previously that for any specific output on PP' there is a locus of points associated with that output such that the marginal rate of substitution of A in consumption is equal to that of B. We shall see now that it is possible to define, for any specific output on PP', a single point on its specific contract curve such that the common marginal rate of substitution of A and B is equal to the marginal rate of transformation of that output to which the specific contract curve belongs. By finding one such point for each of a large number of specific outputs we shall have a large number of points for each of which the common marginal rate of substitution equals the marginal rate of transformation; the line traced out by these points we shall call the generalized contract curve.

To locate points on the generalized contract curve, select an output J_1 (Figure 2), and draw the box ONJ_1M belonging to that output. As before, place the origin of A's indifference map at O and let it range to the northeast. Place the origin of B's map at J_1 and let it range to the southwest. Instead of drawing in the contract curve specific to output J_1, draw in the income-consumption curve of A (OF_1GJ_1 in Figure 2) and the income-consumption curve of B (J_1F_1HO), both with reference to the price y_1. Since y_1, the relative price we take to be constant for the purpose of deriving the income-consumption curve for A and for B, is equal to the marginal rate of transformation at J_1, the income-consumption curve of A is the locus of points for which the marginal rate of substitution of A in consumption is equal to the marginal rate of transformation at J_1. The same is true for the income-consumption curve of B. At the point of intersection of these two curves (F_1 in Figure 2), the common marginal rate of substitution of A and B will be equal to the marginal rate of transformation for output J_1. Hence, F_1 is a point on the generalized contract curve, and we may say that point J_1 on the production-possibility function "contributes" point F_1 to the generalized contract curve. It may be noted that the contract curve specific to output J_1 (not shown in Figure 2) also necessarily passes through F_1.

By selecting various other points on PP' different income-consump-

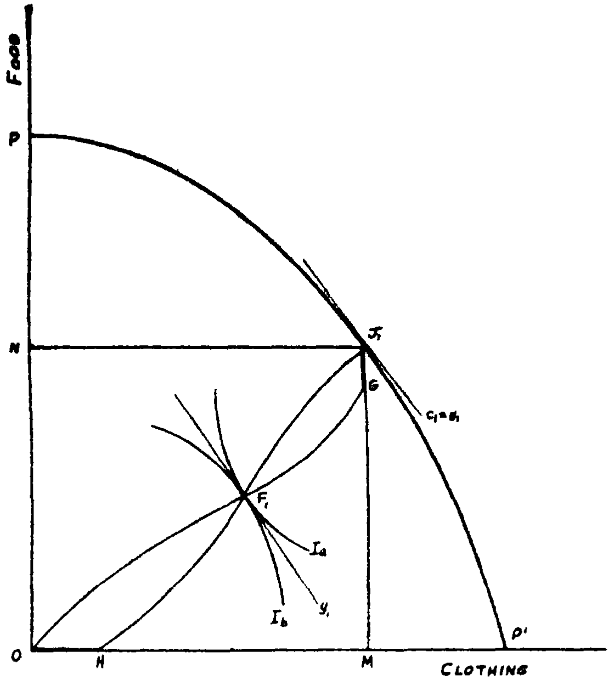


FIGURE 2

tion curves for A and for B can be constructed; and their intersections will give additional points on the generalized contract curve.[6] By connecting these points we draw in OF_1T (Figure 1).

The economic significance of the generalized contract curve in conjunction with the production-possibility curve is that if competition does exist, then the general equilibrium established will yield a pair of points, one on the production-possibility curve and the other on the generalized contract curve, such that the marginal rate of transformation (opportunity costs) between food and clothing in the productive sector will be equal to the marginal rate of substitution between food and clothing for both A and B in the exchange market. This condition is represented in Figure 1 by all possible pairs of points J and F; that is, a point on the production-possibility curve and the point contributed to the generalized contract curve by this point on the production-pos-

[6] It is possible to select points on the production possibility function which "have" nonintersecting income-consumption curves. Since the forces of competition would never lead the economy to such a point on PP' we can disregard these points.

On the other hand, it is entirely possible that a pair of income-consumption curves could intersect more than once. Such an *embarras de richesse* would make it very difficult actually to draw in the generalized contract curve, as has been done in Figure 1, but would in no way alter, or detract from the meaning or significance of the generalized contract curve.

sibility curve. Thus any pair of points J and F fulfills the conditions of the Paretian general optimum of production and exchange for our model.

To summarize, our model of general equilibrium contains the following elements: a production-possibility function (PP' in Figure 1); a generalized contract curve OF_1T; a family of specific contract curves of which OF_1J_1 is the contract curve specific to output J_1; a division-of-output function KL; and an index of output OJ_1. Full equilibrium in a competitive model will establish a pair of points such as J_1 and F_1. If an output J_1 is established, then opportunity cost will be c_1, with OD_1 of OJ_1 output going to A and the remainder D_1J_1 going to B in payment for the services of land and labor given up to the productive sector by A and B (Figure 1). Given their initial holdings of food and clothing, A and B will engage in trade at some price which will carry them onto the specific contract curve of output J_1. If we have, by luck, chosen the general equilibrium output, then the price established in the exchange market, y_1, will be equal to c_1, and the exchange that A and B engage in will carry them not only onto the specific contract curve at F_1, but also onto the generalized contract curve, since F_1 is the point contributed to the generalized contract curve by J_1. Full equilibrium will be established with the marginal rate of transformation (c_1) equal to the marginal rate of substitution for both A and B (y_1).

To facilitate the analysis of excise taxes, we shall make one more assumption with respect to the organization of the economy: The productive sector is assumed to be entirely separate from the exchange market and the only information the productive sector has on which to act, aside from a knowledge of production functions, is the relative prices of goods and services; that is, A and B, as exchangers, are assumed not to communicate directly with the productive sector.

II. *Price, Output, and Income Effects*

We turn now to the analysis of the effects that an excise tax on one of the two commodities will have on commodity and factor prices, the composition of output, the division of output between A and B, and the welfare of A and B. The pair of points J_1 and F_1 in Figure 3 characterize a possible competitive equilibrium position of our system in the absence of any excise taxes. Now let an excise tax of x per cent be applied to the sale of clothing. This means that the purchasers of clothing will be required to pay for it a price of $(y_1 + t_1)$, where t_1 is x per cent of y_1 while the purchasers of food will be able to exchange clothing for food at the old price of y_1 as long as output J_1 persists. The first and lasting effect of this tax is to destroy the efficiency with which output J_1 is

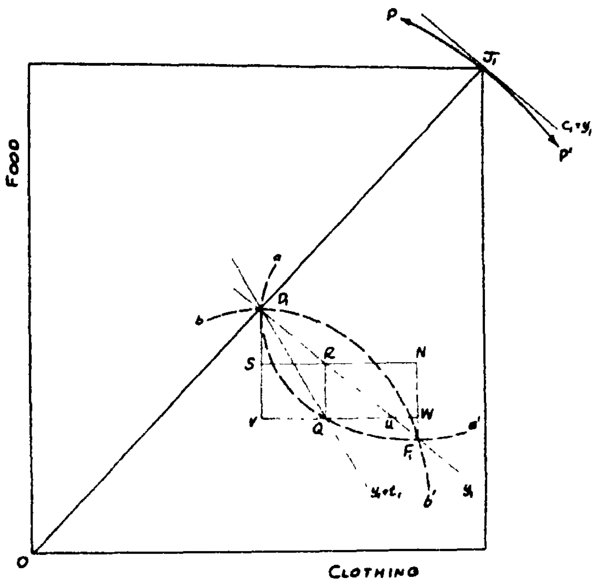


FIGURE 3

distributed by requiring A to pay a different price for clothing $(y_1 + t_1)$ than B receives (y_1) for selling clothing to A.[7] With different prices facing our two exchangers, it is no longer possible for both A and B to equate their marginal rates of substitution between food and clothing to a single price, and hence the marginal rate of substitution between food and clothing will no longer be the same for A and for B. A second effect of the tax is to destroy the equilibrium of the system and to require a new general equilibrium to be found which is consistent with the tax on clothing.

At the new price $(y_1 + t_1)$ confronting him, A would want to exchange food for clothing until he again equated his marginal rate of substitution to price. This would occur at point Q, the intersection of $(y_1 + t_1)$ with A's offer curve aa', which would require A to exchange D_1V food for VQ clothing. On the other hand, since B is a seller of clothing and a buyer of untaxed food, his plans would not be affected by the tax on clothing. Price y_1 would remain the price at which he could exchange clothing for food, and point F_1 would continue to be the optimal position in consumption for B. However, since B can sell

[7] "An excise tax interferes with allocating efficiency, because it makes the relative price of the taxed commodity different for different members of the community—producers being interested in the price net of tax, and consumers in the price including tax." T. Scitovsky, "A Reconsideration of the Theory of Tariffs," *Rev. Econ. Stud.*, Summer 1942, IX, 94 (also reprinted as Chapter 16 in *Readings in the Theory of International Trade*, ed. by H. S. Ellis and L. A. Metzler [Philadelphia, 1949]).

to A only as much clothing as A is willing to purchase, B's sales of clothing would, as Figure 3 indicates, fall short of that amount necessary to allow him to reach point F_1. At the existing pair of prices, A would purchase VQ (equal to SR) clothing from B with D_1V food, D_1S of which would go to B in payment for SR clothing, with the balance SV taken by the taxing agency. Exchange between A and B to this extent only, while allowing A to locate at his optimal position in consumption, Q, would leave B located at point R, a suboptimal position with respect to price y_1, unable to engage in the further exchange which would be necessary to carry him to F_1 for want of a buyer of clothing. If, then, trade is carried on until the pair of points Q and R are reached in consumption by A and B, the existing pair of prices y_1 and $(y_1 + t_1)$ would have failed to clear the market, for B would be left with an excess supply of clothing equal to RN and an excess demand for food equal to NF_1. Since the productive sector responds to, and only to the signals of excess supply and demand, more food and less clothing will be produced, and the original pair of prices and output will not persist.

Adjustments in output will be carried out in the productive sector, which will in turn require changes in relative factor prices, until an output is arrived at in the productive sector and a pair of prices is found in the exchange market which clears the market; that is, a pair of prices which makes it possible for A to equate his marginal rate of substitution between food and clothing to the price-plus-tax, and B to equate his marginal rate of substitution to the price established, with excess supply and demand of either commodity equal to zero.[8] In Figure 4, let this pair of equilibrium prices be y_2 and $(y_2 + t_2)$, and let the output be J_2. The price of food would be higher than that shown by y_1 in Figure 3, and the price of clothing including tax would be lower than that shown by $(y_1 + t_1)$. The new output, J_2, would be made up of a higher proportion of food than in the case of J_1. The division-of-output function would tell us, if it were drawn in, that OD_2 of food and clothing would go to A and the remainder to B. A will exchange D_2V food for VQ clothing and locate at point Q in consumption. B will exchange VQ clothing for D_2S food and locate at point N in consumption. The remainder of the food, SV, will go to the taxing agency, and for the present we ignore the possible effects of the spending policy of this agency. Both A and B achieve their optimal positions in consumption,

[8] It is not within the scope of this paper to discuss the stability conditions of the model. We shall assume that positions of stable equilibrium do exist. It can be shown that stability depends on the preference functions of all individuals, the asset structure of all individuals (by this we mean the ratio in which individuals hold land and labor and not the absolute amounts held), and the production functions of all commodities. The more similar are the first two among individuals and the last among commodities, the more stable will the system likely be. It appears that similarity breeds stability.

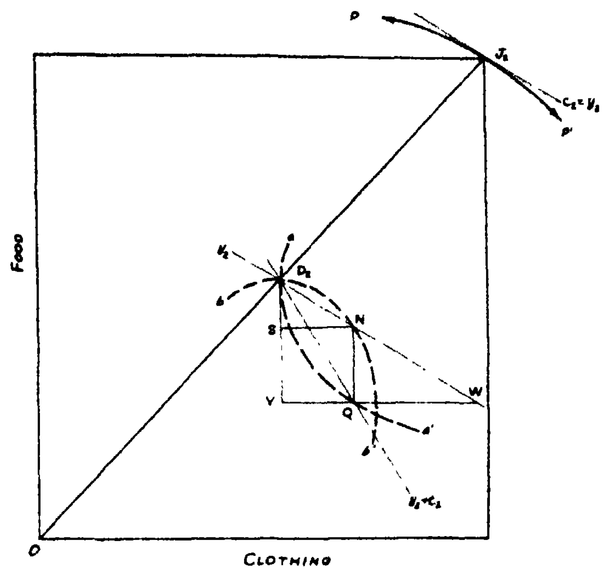


FIGURE 4

given their "incomes" and the prices that confront them. There exists no excess supply or demand of either commodity. Hence, the triplet of points J_2, N, Q characterizes a full general equilibrium position of the model given an excise tax of x per cent on clothing.

Since the points N and Q are not on the specific contract curve of output J_2, they can hardly be on the generalized contract curve. The economic significance of this is that not only has the distributive efficiency of the system been impaired (by the dual prices), but so has the productive efficiency of the system been impaired. This is true because for at least one individual (in this case A), the marginal rate of transformation of food into clothing does not equal the marginal rate of substitution between food and clothing. The taxing agency has reduced the welfare of the community A-B in two distinct ways:[9] first, by withdrawing SV amount of food from the market; and second, by establishing a tax structure such that it is not possible to satisfy the conditions of the Paretian general optimum of production and exchange.[10]

[9] At this point we cannot say that the taxing agency has reduced the welfare of A and/or B for as yet we do not know if either A or B is worse or better off. We know that either A or B must be worse off and that perhaps they are both worse off. We shall further explore this matter shortly.

[10] The same tax SV could be collected in another way so as not to impair the productive or distributive efficiency of the system (*cf.* R. K. Davidson, "The Alleged Excess Burden of an Excise Tax in the Case of an Indiviudal Consumer," *Rev. Econ. Stud.*, 1953, XX, 209-15). We might ask at this point, why does not A escape the burden of paying an excise tax on clothing by taking his D_2V food, not to the exchange market for VQ

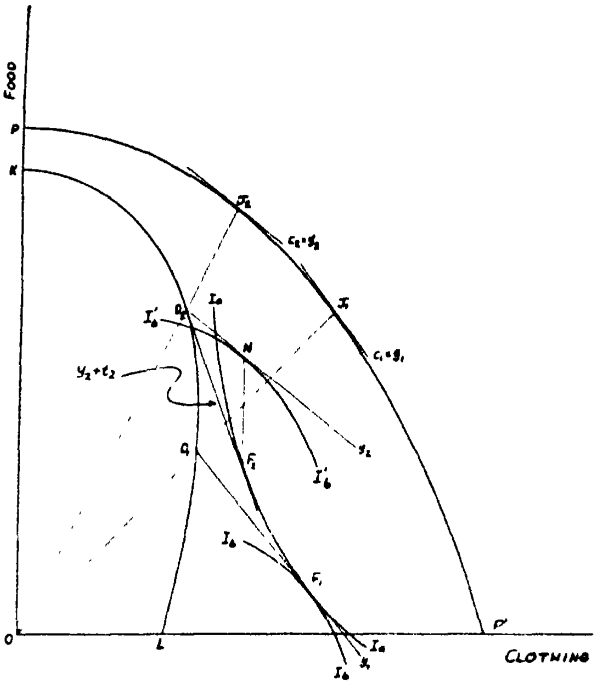


FIGURE 5

At first glance it looks as if the burden of the excise tax falls directly and entirely on A, the purchaser of clothing, and not at all on B, the purchaser of food. But because A "pays the tax" in the crude sense of handing over a certain amount of food to the taxing agency, this does not mean that the entire burden of the tax does fall on A, in the sense that A becomes worse off after the tax is levied, and that B's welfare is unaffected by the tax on clothing. In fact, it is possible to define situations in which A is better off as a result of the tax, and situations in which his welfare is unaffected by the tax, as well as situations in which he is made worse off by the tax.

From the shape of the KL function in Figure 5 we see that when clothing is taxed and, as a result, the output of food increases, A's share of output increases. This is because A owns a more than proportionate

clothing, but to the productive sector and transform it into VW clothing? The answer is that we assume that the productive sector responds to the signals of excess supply and demand only and not to the implorings of individuals. In the economy of the United States it is not possible for individuals to go to Durham, say, and directly transform their labor power into cigarettes to avoid paying federal, state, and local taxes. An excise tax on clothing can be collected only if clothing is purchased in the exchange market, and although A may refrain from buying clothing, he is forbidden to transform his excess supply of food into clothing in the productive sector.

share of land, the factor whose relative price increases as the output of food increases. The question now is whether A will be better or worse off after paying taxes on the clothing he purchases. It is possible to conceive of an after-tax equilibrium such that we would have an output combination J_2 (Figure 5), a pair of prices y_2 and $(y_2 + t_2)$, and a division of output D_2 which together would result in A being just as well off after the tax as before the tax, leaving the full burden of the tax to be borne by B. In this special case the benefit of an increased price for labor accruing to A would be just offset by the burden of an increased price for clothing on A. With output J_2 divided at D_2 and with a price for clothing of $(y_2 + t_2)$, where y_2 is less than y_1, but $(y_2 + t_2)$ is greater than y_1, A would exchange food for clothing up to F_2, on indifference curve I_a, the curve he was originally on at point F_1. B would exchange clothing for food at a price y_2 up to point N on indifference curve I'_b, which is lower in his preference system than is curve I_b, the curve he was originally on at point F_1. Hence, even though A pays the tax by handing over to the taxing agency F_2N food as he purchases clothing, the entire burden of the excise tax would be shifted to B if output were to change in response to the excise tax from J_1 to J_2.

For shifts of output into food greater than the shift from J_1 to J_2, A's post-tax position will actually be superior to his pretax position, and B would suffer not only the entire tax burden, but also the burden of A's enhanced income position. For shifts of less than J_2, the burden of the tax will be divided between A and B, with A bearing the entire burden in the unlikely event that there is no output shift into food. In the even more unlikely case of clothing being an inferior good to A, a tax on clothing would give rise to a greater output of clothing, and A would then bear the entire burden of the tax plus the burden of B's superior income position.

The magnitude of the output shift into food required to place the entire burden of the tax on B depends upon the rate at which A's share of output increases as more food is produced. This rate, shown by the curvature of KL, as we have seen[11] depends mainly on the following two factors: (a) The ratio in which A (and hence B) own land and labor. The greater the ratio of land to labor owned by A the greater will be A's increase in the share of output as more food is produced. (b) The difference in factor utilization between the labor-intensive clothing industry and the land-intensive food industry. When factor intensities are different a change in the composition of output will require, assuming full employment, factor-price changes in favor of the factor intensively used by the expanding industry, which in this case, is land. The

[11] *Supra*, p. 346.

greater is this difference in factor intensities, the more the price of land must rise and the price of labor fall, and the more will *A* benefit by a given change in the composition of output in favor of food.

The actual change in the composition of output in favor of food that does take place in any given case depends upon the following four factors:

1. The excise tax levied on clothing. The greater is the excise tax levied on clothing, the greater will be the shift into food.

2. The marginal rate of substitution for *A* and for *B* between food and clothing. The closer substitutes food and clothing are for *A*, the greater will be *A's* shift into food when clothing is taxed. For *B*, as more food is produced, its price in terms of clothing will increase, and the less close substitutes these two commodities are, the less rapidly will *B* decrease his consumption of food as its price increases.

3. The tax-expenditure policy of the taxing agency. The greater is the proportion of tax receipts "spent" on food, the greater will be the output shift into food. In the above analysis we have implicitly assumed that the taxing agency purchased no clothing from *B* and did purchase, in effect, only food with its tax receipts. Alternatively, the taxing agency could spend its entire tax receipts *SV* (Figure 3) on *QU* clothing by engaging in exchange with *B* at the untaxed price of y_1. As a result of this additional exchange *B* would find it possible to locate at point *U* in consumption and consequently his excess supply of clothing would be reduced from *RN* to *UW* and his excess demand for food reduced from NF_1 to WF_1. The increase in the output of food and the decrease in the output of clothing necessary to wipe out the existing excess supply and demand for clothing and food, to bring the system into general equilibrium, would then be smaller than before. If point *U* were located on top of point F_1, then the equilibrium of the system would not be disturbed by the tax, for both excess supply and demand would remain equal to zero. There would then be no change in the composition of output in response to the tax on clothing and the entire burden of the tax would fall on *A*, the purchaser of taxed clothing. For a more complete analysis of the equilibrium position of the system after an excise tax is applied, knowledge of a "government preference function" or a set of expenditure plans stating the proportions of food to clothing on which the taxing agency would spend its tax receipts at various levels of prices and receipts would be required.

4. The difference in the land-to-labor ratio used in the labor-intensive clothing industry and the land-intensive food industry at given factor prices. The smaller is this difference, then the closer substitutes food and clothing are for each other in production. The closer the two commodities are substitutes for each other in production, the greater will be the

output response of food to a given increase in the price of food. In geometric terms, the closer food and clothing are substitutes for each other in production, the flatter will be the curvature of PP', the production possibility curve, in the neighborhood of point J_1 (Figure 3). The more closely PP' parallels y_1 in the neighborhood of J_1, then the greater will be the increase in the output of food in response to a given increase in the price of food.

Hence, the manner in which the incidence of the burdens and benefits of an excise tax rests upon A and B depends upon the production functions of both commodities, the structure of asset holdings and the preference functions of both individuals, and the government tax and expenditure policy. This is, of course, not a surprising result, and many economists might have long suspected that a careful application of general equilibrium analysis would yield these conclusions as a matter of course.

III. *Conclusions*

It has not been possible for the author to construct an analogous model for an n-dimensional economy. However, on the basis of the preceding analysis, it does appear possible to draw a few rather weak conclusions regarding the burdens and benefits an excise tax will bring about in a more complicated economy.

In the usual case where elasticities of demand are greater than unity, total spending on the output of any given industry will decrease as that industry is taxed. The output of the taxed commodity will decrease and its price will increase. Demand for the complements of the taxed commodity will decrease and both the price and output of these commodities will fall. Resources will be released by the taxed industry and industries producing commodities complementary to the taxed commodity. Increased spending will be directed toward the output of industries producing substitutes for the taxed commodity and to the industries producing commodities complementary to the substitute commodities of the taxed commodity. Additional resources will be demanded by these expanding industries. If the economy is to respond to the change in spending with a change in the composition of output, it will be necessary for relative factor prices to change if it is the case—as a priori appears likely—that the contracting industries employ factors, and hence release them, in different proportions from those characteristic of the potentially expanding industries.[12] The relative prices of certain factors will fall, irrespective of whether they are employed by

[12] On this point, see J. Robinson, "Rising Supply Price," *Economica*, N. S., Feb. 1941, VIII, 1-8; reprinted in *Readings in Price Theory*, ed. by G. J. Stigler and K. E. Boulding (Chicago, 1952), pp. 233-41.

the contracting industries or all other industries,[18] and the owners of these factors will be, *ceteris paribus,* worse off because of the tax. The relative prices of certain other factors will rise, no matter where they are employed, and the owners of these factors will be, *ceteris paribus,* benefited because of the tax. In order to know just which factors will be made worse off and which better off, it would be necessary to know: (a) the industries away from which consumers direct their spending, and the industries toward which they direct their spending, as the output of one industry is taxed; (b) the direction of spending of the additional tax receipts by the taxing agency; and (c) the proportions in which the expanding industries and the contracting industries employ the various factors of production. The excise tax will also exert a burden on the consumers of the taxed commodity, the substitutes of the taxed commodity, and the complements of these substitutes; and the burden will be heaviest for those consumers for whom there exist few, or no close substitutes for the taxed commodity. The excise tax will benefit not only those owners of factors of which the prices have increased, but also the consumers of the complements of the taxed commodity.

Again, if we knew the preference functions and asset holdings of all individuals, the production functions of all commodities, and the tax and expenditure policy of the taxing agency, we could arrange all individuals on a "benefit-burden" scale according to how their welfare is affected by an excise tax on a particular commodity or group of commodities. The burden limit of this scale would be occupied by those individuals whose welfare would be reduced the most by the effects of the tax: those individuals who are heavy consumers of the taxed commodity, its substitutes, and the complements of its substitutes—that is, consumers who happen to have strong preferences for those commodities whose prices increase because of the tax—and who are also owners of factors which are intensively used by the contracting industries and which suffer a relative price decrease. The benefit limit of the benefit-burden scale would be occupied by those individuals whose welfare would be increased the most by the effects of the excise tax: those individuals who have strong preferences for the complements of the taxed commodity and for whom there exist many close substitutes for the taxed commodity, and who are also owners of factors intensively used by the expanding industries. The remaining individuals fall somewhere between these limits, depending on how strongly the benefit-burden forces of increased—or decreased—commodity and factor prices operate on each individual as a consumer and as a factor-owner.

Unfortunately, it appears that for the *n*-dimensional case, just as for

[18] Since factors of production are assumed to be mobile.

the two-dimensional case, more knowledge is necessary than is available to place individuals on such a benefit-burden scale. Even worse, one crude inference which it was possible to make in the two-dimensional case cannot be made for the *n*-dimensional case. We know that with only a labor-intensive clothing industry and a land-intensive food industry, a tax on clothing will, *ceteris paribus,* make owners of land better off because the price of land would increase relative to the price of labor. However, in the *n*-dimensional case, it is not possible to know beforehand, in the absence of complete information, which factors will benefit from a shift in demand, simply because it will not be known to which industries spending will be transferred.

Our knowledge of incidence for any "real" economy now appears to very slight indeed. We do know, however, that excise taxes exert benefits as well as burdens on individuals; and we are also aware of the main factors involved in the spread of the benefits and burdens of an excise tax in a competitive economy. The foregoing observations further suggest that more specific results concerning the incidence of excise taxes can be obtained for those cases in which additional appropriate assumptions regarding the shapes of the relevant parameters (preference functions, production functions, relative size of industry taxed, etc.) can be made in such a way as to eliminate the general equilibrium consequences of these taxes and confine their effects to definite individuals, or groups of individuals, in the economy. For example, the long-established theorem of partial equilibrium analysis that the burden of an excise tax on a particular commodity will be divided among the consumers and producers of the taxed commodity according to the elasticities of supply and demand requires only the additional assumption that the taxed industry is so small that the prices of all *other* commodities and the prices of *all* factors do not change.[14]

[14] For statements of this theorem, *cf.* Edgeworth, *op cit*, pp. 48-53; Marshall, *op .cit.*, pp. 413-15; J. F. Due, *The Theory of Incidence of Sales Taxation* (New York, 1942), pp 17-53 For a somewhat different example of the complementarity between the more established types of excise tax analysis and the analysis presented in this paper, *cf.* J. A. Stockfisch, *op cit*

POST-KEYNESIAN ECONOMICS[1]

A Review Article

By ALVIN H. HANSEN*

This is a collection of essays by fifteen authors whose names are for the most part well known. The book is divided into three sections, the first of which relates to monetary theory and policy; the second, to economic fluctuations and growth; and the third, to aggregative economics and testing. On a somewhat different basis of classification, three chapters are empirical in character, two compare current economic thinking with earlier doctrines (Marx and the classicals), five are concerned with monetary theory and policy, four with cycle policy (investment control, depreciation policy, income distribution, institutional change), and one with nonlinear cycle theories. While Part III is much the best, some of the chapters in the first two parts make rewarding reading. And though my review is essentially critical, I feel that the book is decidedly worth while.

Does the volume live up to its title *Post-Keynesian Economics?* Yes and no. It is post-Keynesian in the sense that most of the discussion is cast in terms of the Keynesian tools of analysis. It is post-Keynesian in that the endeavor is made here and there to improve on Keynes, but the result in this respect is far from impressive. It is post-Keynesian in the sense that a part of the volume is devoted to "filling the empty boxes" of the Keynesian analysis with empirical data. Especially notable here is Klein's chapter—an outstanding contribution—and those by Tarshis and Modigliani. It is post-Keynesian in the respect that it seeks in two chapters (Tsuru and Streeten) to assess the Keynesian stream of thinking against the background of earlier traditions. It is post-Keynesian in the respect that it takes a fresh look in a number of chapters at policy programs stemming from the Keynesian system.[2]

On balance the gleanings must be set down as relatively meager, though the volume does contain, as indicated above, a number of notable chapters. That the gleanings are somewhat meager both with respect to tools of analysis and policy matters, after nearly twenty years of voluminous discussion, makes Keynes' individual work stand out all the more strikingly as a truly Herculean contribution to modern economics.

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[1] K. K. Kurihara, editor, *Post-Keynesian Economics* (New Brunswick: Rutgers Univ. Press. 1954. Pp. xviii, 442. $8.50).

[2] The title *Post-Keynesian Economics* might, however, lead the reader to think that the volume perhaps attempts a survey of the literature which has appeared since 1936. This is not the case. Current literature is of course touched upon here and there but only in a casual manner.

First let us consider the empirical studies. Keynes' system is built on the foundation of several specific hypotheses concerning human behavior. Does empirical investigation support or contradict this foundation? This is the question to which Klein addresses himself. He notes that the essence of Keynesian economics can be stated as follows: "The system of classical competitive equilibrium does not automatically lead to a stable solution of full employment" (p. 281).

The only empirical findings to date, says Klein, that are in any way contrary to the essence of Keynesian economics are the data on the influence of liquid wealth on saving—the so-called Pigou effect. But the empirical evidence is not clear-cut against the Keynesian theory, the evidence being mixed in direction of effect. At all events, the magnitude of the "marginal asset effect on saving is probably not large enough to render market forces adequate operators of adjustment towards full employment equilibrium" (p. 294).[3]

Klein's chapter, which no economist can afford to neglect, is remarkable for the vast range of empirical materials, covering all aspects of the Keynesian analysis, which are surveyed. He concludes that the Keynesian system is "firmly rooted in fact" and that any reader, whether convinced or not, must at any rate agree that the empirical evidence is not superficial or casual.

Tarshis has given us, in his essay on "The Flow of Business Funds, Consumption and Investment," a welcome contribution. Keynes put forward the proposition that consumption is a function of *national* income. Much of the literature, however, has restricted itself to the relation of consumption to disposable income—a much narrower concept. When consideration is given to the multiplier effect of an increase in investment or a reduction in the taxes on consumers, it is the marginal propensity to consume out of an increment of *national* income that is relevant. The bites taken by the progressive rise in business saving and by a progressive tax system (individual and corporate combined) are far more important than the saving of individuals in determining the slope of the consumption function and so the multiplier. We have had too little empirical investigation of the "tax bite" and of the "business savings bite." Keynes, as Tarshis reminds us, had much to say about the important role of dividend policy and depreciation policy in establishing the relation between income and consumption.

The gross national product is equal to consumption plus individual saving plus gross business saving plus *net* taxes. By "net taxes" I mean total tax receipts minus transfer payments. Tarshis calls this "government saving," but this seems to me an unfortunate term. He presents tables for these three categories from 1929 to the present, showing their relative importance in holding consumption below the GNP. Personal saving throughout the period has played a relatively small role.

[3] Referring to two recent studies of the consumption function (Ruth Mack's in *A Survey of Contemporary Economics*, Vol. II [Homewood, Ill., 1952], and R. Ferber's *A Study of Aggregate Consumption Functions*, Nat. Bur. Econ. Research Tech. paper [New York, 1953]), Klein concludes that neither of these studies is sufficiently discriminating in its choice of empirical studies since they "draw upon results that are open to serious criticism from an econometric point of view" (pp. 294-95).

Tarshis also examines the impact of business saving on investment (pp. 381-86) and the role of *sources* of funds (retained earnings, stock issues, borrowing) on decisions to invest. Keynes undoubtedly did not pay adequate attention to the availability of internal corporate funds and their impact on investment decisions.

The third empirical essay is the chapter on "Utility Analysis and the Consumption Function" by Modigliani and Brumberg. What is the impact of long-range plans and expectations on consumption expenditures? Current income, expected future income, initial assets, and age, are among the more significant factors. Since it is not possible to obtain the relevant data from the observation of individuals over time, the authors content themselves with "cross-section" data on the average and marginal rates of consumption with respect to household incomes.

From their so-called "stationary" cross-section data, they conclude that (despite appearances to the contrary) the *proportion* of income saved is in reality independent of the household income bracket, but tends to rise with age. The regression of consumption on income *tends* to be linear and a line fitted to the data tends to go through the origin. But a household whose income *unexpectedly* rises will save more than the normal ratio.

These propositions are certainly rather novel. Margaret Reid had, however, already suggested that there is "good reason to believe the percentage of income saved to be independent of the economic level of the separate families."[4] Earlier writers (Brady and Friedman) have found from family budget studies that the *ratio* of saving to income *is* a function of the family's position on the Lorenz income distribution curve—a proposition contrary to the one stated above. Nevertheless the ratio of aggregate saving to aggregate family income *over time* is not thought to be a function of income.[5] This however does not tell us what is the relation of consumption to *national* income either in the business cycle short run[6] or over the longer run.

Now Modigliani and Brumberg agree indeed that the data do show that the *ratio* of saving to income is a function of the income bracket in which a household's income falls, but they hold that the higher *ratio* of saving to income in the upper brackets is not due to the fact that they are upper-bracket incomes. Rather, this rising ratio is due to the fact that households in these upper brackets are, by and large, "recent arrivals." Their current incomes are above their *accustomed* incomes, and therefore they tend to save a higher ratio of income. If the new income is regarded as *transitory* the saving ratio will rise. Or, in the event that the new income is regarded as permanent, the initial asset holdings are now out of line with the revised outlook. Thus the saving ratio must rise in order to bring the asset holdings up

[4] See *Savings in the Modern Economy*, ed. by Heller et al. (Minneapolis, 1953), p. 219.

[5] See also James Duesenberry, *Income, Saving, and the Theory of Consumer Behavior* (Cambridge, Mass., 1949).

[6] Modigliani and Brumberg's chapter relates to budget studies and not to the behavior of consumption in relation to national income over the cycle. Thus their attack (p. 43) on those who have employed the Keynesian consumption function is not valid. The secular aspect of the matter is something else again. See in this connection my *Guide to Keynes*

to a level commensurate with the new income.[7] But if all incomes were at their accustomed levels, the ratio of saving to income would, they believe, be quite unaffected by the level of the household's income. In the absence of unexpectedly large incomes, the authors suggest that households save primarily to cushion against major variations in income over the life cycle, and that the savings which a household wishes to make and can afford to make must be basically *proportional* to its basic earning capacity.

This conclusion is admittedly a tentative one and the authors wisely refrain from dogmatism. Whether right or wrong, is the hypothesis at variance with Keynes' formulations with respect to the relation of consumption to income? In answer to this question the authors are, to put it mildly, a bit irresponsible. They fail to point out that their conclusion does not in the least contradict Keynes' statement that we can take it as a "fundamental psychological rule of any modern community[8] that, when its real income is increased, it will not increase its consumption by an equal *absolute* amount" (*General Theory*, p. 97). Instead they claim that they depart from Keynes. But their citation from Keynes consists of a casual side remark and not from his central argument. Moreover the citation significantly omits the phrase "as a rule" which, if included, would have shown that Keynes made no firm "contention" about the *proportion* of income saved as income rises.[9] Finally, and this is highly important, Keynes was talking about the behavior of the "modern community" as a whole, including business saving as well as individual saving. Thus Modigliani and Brumberg are not even talking about the same thing as Keynes! And even though they were, it is not true that their findings (if verified) would show Keynes to be in error.

Tsuru is concerned with the history of economic ideas with special reference to Keynes and Marx. The appearance of the *General Theory* caused at first a sharp division among the ranks of economists between those who emphasize the income effect and those who emphasize the "efficacy of cost-price relation-

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(New York, 1953), pp. 75-78; also my *Business Cycles and National Income* (New York, 1951), pp. 164-70.

Moreover, the proposition that the *ratio* of saving to income is independent of income is often misinterpreted to mean that *saving* is not a function of income. This misconception has led to a vast amount of confusion, and to quite unfounded charges that Keynes' position has been proven to be in error.

[7] This lag effect is emphasized by Keynes on p. 97 of the *General Theory* where he discusses the difference between one's "actual income" and one's "habitual standard." But is this sufficient to explain the higher saving ratio in the upper income brackets? Is it not also true, as Keynes put it (p. 97), that the "motives towards accumulation" only acquire effective sway "when the margin of comfort has been attained"?

[8] Note that Keynes speaks of the modern *community*, and that his elaborate discussion of the psychological behavior pattern of the community involves not only the behavior of individuals as consumers, but also as government officials managing sinking-funds, and business officials managing depreciation funds, etc. The current literature is full of misinterpretations of Keynes' "psychological law."

[9] Indeed in the very next sentence, following the phrase which our authors quote, Keynes explicitly disavows any firm contention, for he says: "But whether or not a greater proportion is saved, we take it as a fundamental psychological rule . . . etc." (The completed sentence is given above.)

ships." This division has gradually given way to "an attempt at synthesis." Marx, while recognizing the effectiveness of price adjustments, developed his theory largely in terms of "long-run normal price." "In other words, 'parametric adjustments' have no place in the stage of abstraction where Marx took up his aggregative analysis" (p. 333). Tsuru attempts to contrast the Keynesian aggregates and the Marxian aggregates in economic analysis. This effort necessarily requires a good deal of reading between the lines.

Streeten's excellent chapter is on "Keynes and the Classical Tradition." Attention is centered around the "harmony of interest" doctrine. "Keynesian theory strengthened the utilitarian tradition because it resolved one of the great moral dilemmas of the neo-utilitarians" (p. 351). A more egalitarian income distribution might raise general welfare, but inequality appeared to be necessary to safeguard adequate savings and so investment. Thus greater equality might defeat, as the utilitarians saw it, its own purpose. But Keynes' consumption function analysis showed that a decrease in thrift might in fact raise income and investment, and so there might well be no conflict.

While Keynes believed in the virtues of the free market and the pricing system, Streeten continues, his measures for regulating investment represent a break with liberal-utilitarian tradition. Moreover, he did not believe, as did Mill, that production would "look after itself." Here he was more like List than the classicals. Keynes thought that the state must take certain actions "in order to create the right environment for private self-interest to work."

Keynesian policies are designed to promote employment and prosperity—the "interests of all." Then why is there opposition to Keynesian policies? There are various reasons, *e.g.*, they may undermine the discipline of workers, entrepreneurs may fear that their power and status in society will be reduced, etc.

Streeten suggests that Keynes believed more strongly in a "harmony of interests" than recent full-employment experience would warrant. Here he calls attention to the oft expressed fear that full employment and price stability are incompatible. (Streeten, however, fails to canvass adequately American experience since 1948.) Reference is also made to the conflict that may arise between full-employment and balance-of-payments problems.

Under large-scale unemployment, one group's gain need not spell another's loss. But with full employment, conflicts over the "full-employment pie" emerge.

In the Victorian society, convention and superstition tended to prevent an open conflict of interest. The gold standard, the balanced budget, the acceptance of unemployment, etc., testify to the "submission to external unquestioned rules and conventions" (p. 362). But this quasiharmony broke down because the loss of these ancient beliefs "stripped the structure of economic relations of the superstitions which had cemented them." Keynesian economics helped to destroy the "barriers which prevented the full pursuit of a selfish manipulation of society," and thus brought "clashes into the open" (p. 362).

Yet Keynes' thought is "unmistakably in the classical liberal-utilitarian

tradition." He advocated the "regulation of *aggregates* only." Nevertheless, in a country pledged to full employment, the classical conflict of interests has again more or less come into its own, and in addition new problems have arisen.

A number of chapters deal with the business cycle, partly in terms of theory but more often in terms of policy. Matthews' paper is on "Capital Stock Adjustment Theories" and the problem of stabilizing investment at a level "such as not to cause the stock of capital to increase so rapidly that a decline in its marginal efficiency occurs" (p. 173). The boom level of investment is not maintainable for reasons made plain by the capital stock adjustment theories. "The dilemma is, then, that a rate of investment high enough to give full employment leads to excessive capital accumulation and is not maintainable" (p. 173). Investment must therefore be stabilized at lower than the boom level and this would require for full employment a rise in the consumption function; or alternatively there might be offsetting increases in government spending.

Matthews poses this problem in relation to three theories of the cycle: (1) Schumpeter's innovatory investment theory, (2) the Wicksell-Frisch theory of damped cycles sustained by erratic shocks, and (3) the theory of antidamped cycles whose explosive tendencies are contained by various restraints (Hicks, Goodwin). It is the "ceiling theory" to which Matthews devotes primary attention. The ceiling may be imposed by a general shortage of factors or by bottlenecks in the investment industries—the "investment ceiling." In place of the ceiling hypothesis, we have Keynes' view that full employment of factors is likely to "transform a boom into a cumulative inflation of wages and prices" (p. 180). This Matthews calls "Wicksellian instability."

Matthews closes his theoretical analysis with the conclusion that if the Hicks-Goodwin theory can be at all accepted as realistic (a point left unsettled) then cyclical instability must probably be faced and in addition there is the danger of "Wicksellian instability." Thus the authorities are confronted with the policy alternatives already referred to above. Of these alternatives, Matthews favors a policy of direct control of investment. This policy, he believes, is likely to be effective in a condition of overexpansion such as most countries have had to contend with during the last ten years owing to war-created shortages, and more recently to rearmament expenditures. "But we must not shirk contemplation of the time when this will not be so" (p. 191). Unfortunately, however, the essay throws no new light on how we should solve this problem if and when more normal conditions arrive. Thus this very useful essay is more interesting in its theoretical implications than as a guide to policy.

Ichimura's chapter, largely mathematical, is devoted to a survey and comparison of recent cycle theories. He disregards exogenous theories of the Schumpeter or Spiethoff variations, and rules out endogenous linear theories as unsatisfactory, though he grants that when combined with erratic or quasi-oscillatory shocks, such systems have much to commend them. He devotes his chapter, however, to the nonlinear theory of Kaldor and those of the

Hicks-Goodwin type. He begins his essay with an analysis and reformulation of the Kaldor model, and then moves on to a comparison with other recent theories, at the same time throwing light here and there upon the relation of these to earlier theories.

The essay by Bowen and Meier is instructive and challenging. The last twenty years teach us, they think, that "painful changes in deeply-rooted institutions are involved in any effort to achieve stability via fiscal policy" (p. 164). They conclude that "stabilization necessarily involves change in firmly established institutions and is therefore likely to be difficult of attainment" (p. 168). The most difficult obstacles are: (1) the institution of budget-balancing, (2) the ponderous legislation procedures with respect to fiscal policy, (3) intergovernmental relations in a federal system, (4) the traditionally established dichotomy between state and private industry, and (5) the effort of trade unions to raise money wages.

These obstacles form well-established and persistent institutional patterns. It is a delusion, the authors assert, to suppose "that fiscal policy does not require major institutional changes" (p. 165). Fiscal policy of a magnitude to overcome a deep depression "would even today be confronted with strong institutional resistance" (p. 166).

To facilitate a stabilization program they suggest (among other things) a closer coordination of investment and saving involving control over saving or investment, or both. This might involve direct investment by the government and greater equality in income distribution.

The authors agree that a substantial residue of institutional changes bearing on stabilization was left by the social crisis created by the Great Depression—social security, financial reform, a more progressive tax structure, etc. And they agree that the resistance to change may have been "softened up a little by the arguments of economists" (p. 168). But they fear that institutional barriers may before long be "back at par."

Kurihara's chapter is basically a policy chapter, and the program he proposes, to secure full employment and growth, is primarily to raise the consumption function through a redistribution of income. The main defect in the chapter, as I see it, is that his policy directive takes little or no cognizance of social priorities. It may well be that in the visible future what is most urgently needed is public investment expenditures, not only on resource development, roads, etc., but also outlays on health, education, recreation, control of juvenile delinquency, etc., instead of more private consumption via redistribution of income. Greater equality of income up to a point is no doubt desirable, but there may be danger in pushing it so far that the strength of a vigorous middle class—upon which a dynamic society must heavily lean—may be sapped. Over against income redistribution, public investment and deficit financing are important alternative fiscal routes to full employment. The appropriate combination of all possible alternatives requires a careful assessment of social priorities. It is on this basis that we must decide how large the government budget should be, whether it is to be financed by borrowing or by taxes, and if by taxes, what degree of progressivity should be imposed. These matters are somewhat neglected by Kirihara

who concentrates his analysis on (1) raising consumption, and thereby (via the acceleration principle) stimulating private investment, and (2) lowering the rate of interest so as to push private investment toward the point of zero marginal efficiency.

Murad's chapter on "Net Investment and Industrial Progress" presents the thoroughly unorthodox view (with respect not only to classical but also to Keynesian theory) that industrial progress *necessarily* tends toward zero net investment. He begins with the well-accepted thesis that increasing capital accumulation, in the absence of growth of population and changes in technique, will reduce the marginal efficiency of capital eventually to zero. Later he introduces technical change, but argues that if technological advances occur at the same rate in producers' goods industries as in consumers' goods industries, no new opportunities for *net* investment will result from such advances.

Appraisal of Murad's argument necessarily involves consideration of what constitutes true replacement and what constitutes true net investment. To this there is no easy answer. Depreciation funds are not used, in a technologically progressive society, to replace the same old-type industrial machines. They are used to buy new and better machines. If now the depreciation sums set aside for replacement are just sufficient to buy new machines capable of producing the *same* output as the old, and if sums so spent accurately measure *replacement* investment, then (contrary to Murad's view) progress will not rule out net investment. Output all around will have increased, let us say, by 100 per cent; money wages (and other money incomes) will also have increased by 100 per cent while prices of both producers' goods and consumers' goods have remained constant. It now requires only half as many laborers to produce the new machines needed to replace the productive capacity of the old machines. Since wages have doubled, the money cost of these new machines is, however, the same as the cost of the old; therefore, if depreciation has been calculated on a money-cost basis, the depreciation sums set aside will be just sufficient to replace the old machines with machines of equal productive capacity. But half of the labor force has been set free. Hence, concomitant with the advance in technology, *net* investment is continuously necessary to provide the displaced laborers with capital equipment and to implement in terms of increasing output, the fruits of technical advance. Thus on the conditions here stated—and they do not violate his assumptions—Murad's proposition is in error.

Murad himself inadvertently admits this point without seeing how damaging it is to his thesis. He notes (footnote, p. 246) Domar's definition of depreciation as the "cost of replacement of the depreciated asset by another one of *equal* productive capacity." Murad objects to this definition on two grounds: (1) that it is not in accordance with accounting practice, and (2) that such a definition would equate all additions to capital (measured in terms of productive capacity) with net investment. The answer to these objections is first, that accounting practice (depreciation calculated on a money-cost basis) would in fact replace equal productive capacity on the assumptions which I have made above; and, second, that Domar's depreciation

does provide the best answer to the difficult question—what indeed is meant by *net* investment.

Now it was already recognized by J. S. Mill (and I have myself frequently stressed this point[10]) that a society which already has a huge stock of capital *may* enjoy increasing productivity without net investment. This conclusion rests, however, on grounds other than those laid down by Murad. It rests basically on two assumptions—assumptions which are probable, or at least possible, but which are not necessarily concomitant with a large accumulated capital stock. These assumptions are primarily: (1) that, in a modern advanced society, technology in fact has tended to produce capital-saving machines[11] (*i.e.*, technical progress in the producers' goods industries tends to exceed that in consumers' goods industries—*e.g.*, services, etc.) and (2) that accounting practice in fact tends to supply depreciation funds in excess of the amount required to maintain the same productive capacity.[12]

Finally we come to chapters dealing with monetary theory and monetary policy. I am not at all happy about any of these chapters, and I fear that my comments may be overly critical. Dillard's chapter on "The Theory of a Monetary Economy" begins with high promise but fades away at the end, it seems to me, into mysticism. Dillard tries to make something quite special out of Keynes' "Essential Properties of Interest and Money" but fails, I think, to add anything to Lerner's important article.[13] While much of the chapter is well written and thought-provoking, its central thesis does not, in my opinion, stand up well.[14] He attempts to show that in Keynes' theory

[10] In my *Fiscal Policy and Business Cycles* (New York, 1941), I canvassed this matter with some care (see pp. 310-11). Among other things, I stated: "A mature economy may, as Mill stated, under certain conditions modernize and improve its capital equipment, introducing continually new techniques, without tapping any new savings or making any net addition to capital formation. If the progress of technique in the capital goods industries outruns the rise in wage rates, then the accumulated depreciation reserves will be adequate to finance the replacement of an old machine by a new one more productive than the old." Also the following: "When capital saving innovations are made . . . the expenditure of replacement allowances will yield a net increase in productivity."

[11] Murad indeed discusses capital-saving inventions (p. 244), but he does not succeed in clarifying the issue. The definitions which he presents on page 245 are vague and confusing.

[12] See in this connection my "Growth or Stagnation in the American Economy," *Rev. Econ Stat*, Nov. 1954, XXXVI, 409-14

[13] See also my chapter on "Nature and Properties of Capital, Interest, and Money" in my *Guide to Keynes, op. cit*

[14] Dillard attempts to elevate the highly perfunctory chapter which Keynes wrote for the Spiethoff *Festschrift* (Munich, 1933) into a monumental contribution He asserts that this chapter appears to be unknown to English-speaking economists, probably because it appeared in a German volume But Keynes' chapter is in English (other English chapters are by Robertson, Mitchell, Carl Snyder, and Hawtrey), and the volume has frequently been cited by English and American writers on business cycles. In my own case, I have used the volume a good deal and have been familiar with the Keynes chapter from the time it appeared. But I have always regarded it, and still do, as a slight piece, probably dashed off in an hour or two and neither a credit to Keynes nor to Spiethoff in whose honor it was written. As one rereads it, it becomes quite clear that all sorts of things which later were spelled out clearly in the *General Theory* (not simply a *monetary* theory) were floating around in his mind. About the only interesting thing in the essay is the announcement (1933) that he was working on an important new book.

"money holds the key to explaining unemployment" (p. 20); again that "the ultimate theoretical explanation of unemployment must be sought in money" (p. 22); or again, that money is "the strategic factor" upon which Keynes' entire analysis focuses (pp. 19-20). This of course is not the first attempt to show that the whole Keynesian system rests on a single pivot.

Dillard is in fact less one-sided than some of his more extreme statements would indicate. The chapter, however, ends somewhat disappointingly as one encounters repetitions of such phrases as "the monetary theory of employment," "the nature of money as the key institution of modern capitalism," money's "role as a special form of property," etc.

Martin Bronfenbrenner believes that events thus far indicate that, for causes quite apart from war and rearmament,[15] we are now in a new phase of secular inflation owing to "pressure economics" and "Keynesian economics" (p. 39). These new developments certainly raise important issues which deserve careful study. But there is some danger in exaggerating current inflationary forces compared with those of earlier periods. Actually, the first quarter of our century was considerably more inflationary than the second quarter.[16] Or again, wholesale and consumer prices combined (prior to 1913, wholesale prices) rose 143 per cent from 1894-97 to 1923-25, but only 100 per cent from 1931-34 to 1948-50. From 1948 to 1955 wholesale prices have risen less than 1 per cent per annum, whereas from 1897 to 1910 they rose nearly 4 per cent per annum. Where were "pressure" and "Keynesian economics" then? Do these figures show as Bronfenbrenner asserts, that the strongest, most aggressive, and best-disciplined of the pressure groups were held in check, in the pre-Keynesian days, by "limitations of demand" (p. 40)?

Bronfenbrenner suggests that the inflationary movement did not subside during the relative peace years preceding Korea (p. 38). But the facts are otherwise. At the outbreak of Korea, prices stood at 157 compared with 165 for 1948. It is not true that "no substantial reversal of the inflationary trend" occurred in 1951 (p. 39). Wholesale prices turned down in February 1951, falling fairly steadily from 114.8 (new index) to 109.5 at the end of 1954.

It thus appears that it is perhaps too early to get overly alarmed about pressure groups and Keynesian economics. Indeed it may be altogether possible (though I would not venture an opinion) that collective bargaining (stable contracts over a considerable period, etc.) and the increasing spread of Keynesian economics—even involving members of Congress (witness the growing awareness of the impact of tax changes on inflation and deflation)—may give us greater price stability than was achieved over considerable periods in the "good old days."

With respect to the future, however, Bronfenbrenner has no illusions that the old methods could any longer be effective to hold down inflation. Labor

[15] Bronfenbrenner asserts that it is a "convenient escape . . . to ascribe the inflation completely to the military factors of war and rearmament" (p. 38).

[16] From 1900 to 1925, wholesale prices and consumer prices (wholesale prices alone prior to 1913) rose by 103 per cent; from 1925 to 1950 these price indexes rose by only 40 per cent.

will no longer tolerate either mass unemployment or gross inequality in income distribution—both powerful deflationary forces. He pictures labor as currently trying the inflation route to full employment and greater equality. But labor will, he thinks, eventually realize the futility of inflation. The drive toward greater equality will however continue and this may tend to dampen growth and efficiency.

Perhaps, but no such tendencies are currently visible. Bronfenbrenner does not adequately appraise the contribution to efficiency and stability of greatly improved labor-management relations—a development which has taken place during the last twenty years of so-called "pressure economics" and "Keynesian economics."

Turning to Mabel Timlin's paper on "Monetary Stabilization Policies and Keynesian Theory," the reader will note her failure to assess the *real* factors. This is all the more remarkable since her chapter begins with a reference to Section VI of Chapter 21 in the *General Theory* which stresses the complexity of causes underlying price movements, and especially the real factors.

Miss Timlin is quite prepared to argue that during the immediate postwar years (p. 65) the rate of investment should have been restricted despite the vast backlog of urgent needs for additional plant, equipment, and housing. But would a drastic monetary restraint on investment at that time have been desirable? Dennis Robertson years ago reminded us that there are times when price stability is not necessarily to be preferred to other goals. These other goals may not be wholly realizable if price stability is rigidly pursued. Miss Timlin's paper does not realistically examine the painful choices that confronted Canada, no less than the United States, in the years that followed a *total* war in which nearly half of the nation's resources had for years been devoted to military pursuits. Could the interest-rate policy advocated by Miss Timlin have prevented price-level increases without any sacrifice of output and employment goals? And we should certainly have expected from a Canadian a full discussion of the consequences of a Canadian price policy completely at variance with American developments.

The Canadian policy-makers are roundly criticized for their expectation that the postwar inflationary situation might prove to be temporary, and that later on the problem might well be one of inadequate demand in relation to production capacity (pp. 62, 64). But what is the evidence (assuming a peaceful world) that they were not right? The inflation ran out by 1948, and since then a falling price trend has been interrupted only by the eight months of panic buying following the outbreak of war in Korea. They could scarcely be expected to know that we were soon to move into a costly cold-war situation.

Miss Timlin stresses "adequate control over the quantity of currency and bank deposits, exercised through flexibility of yields on the securities entering into the portfolios of central banks" (p. 86). She is unhappy over the reliance placed by the Canadian government on (a) its budgetary surpluses,[17] (b)

[17] Actually the cash budgetary surplus was enormous in fiscal 1947, and substantial in 1948-50. Miss Timlin surely underestimates their role in checking the 1946-47 inflation.

"suggestions" to the chartered banks, (c) consumer credit regulations, and (d) deferred depreciation tax allowances. She would like to have jumped the yields in a "*sharp and sudden and once-for-all* rise" (p. 64) but she thinks that a lagging and niggardly rise in rates, taking place by small degrees (the policy advocated by the New York Federal Reserve Bank), might aggravate the problem. She does not explain how anyone would know exactly how much that sudden sharp rise should be, or what might be the consequences of a drastic fall in capital values generally.

The *minimum* objective, she thinks, should be to prevent any increase of currency and bank deposits and to deter any flow of securities to the central bank. Actually both of these minimum objectives were achieved in the United States, but this did not prevent the price rise in 1946-47. (Currency and demand deposits stood at $106 billion in June, 1946, and at $108 billion in June, 1948,[18] while U. S. securities holdings by the Federal Reserve Banks were $23.8 billion in June, 1946, and $21.4 billion in June, 1948.)

Unlike Miss Timlin who assumes price stability as a *summum bonum*, Vickrey poses the question whether "an economy in which prices are rising steadily" may not be more stable than one with a stable price index (p. 89). He posits a "condition of specified, controlled, and generally anticipated inflation as a respectable and possibly even desirable condition" (p. 90).

The key condition, he thinks, is that inflation be generally anticipated. And it is not difficult, he says, to construct models in which *anticipated* inflation does not of itself produce instability. "Models," perhaps, yes. But what of the actual world?

Varying combinations of interest rates, tax rates, and government spending rates may of course be employed to achieve (in model building at least) any desired trend of prices. On balance, Vickery prefers a high rather than a low money rate since he prefers to operate on a liquidity preference curve that is more nearly vertical.

Vickrey guides the reader through several models, but for the most part he is aware that they have little significance for the real world, however interesting the speculations may be. Among the unrealistic assumptions introduced are the following: (1) real aspects of the economy are unaffected by monetary vagaries and are also fully anticipated; (2) public confidence in the maintenance of a precisely *steady* rate of inflation, say 10 per cent per year[19] (pp. 110, 112, 118).

Currently "wartime destruction and the demands of rearmament" have pushed the productivity of capital up into a range which gives, he thinks, sufficient margin for the effective operation of monetary controls (p. 122). But he concludes that the "long-term trend seems still to be one in which the accumulation of capital, combined with the shift towards capital-saving

[18] In Canada currency and active deficits increased by 10 per cent from 1946 to 1948.

[19] No government can be certain of continuous *full* employment, however much it may aim to achieve this goal. But is it not still more difficult to guarantee exact price stability, let alone an exact percentage *increase* in prices? Vickrey has surely not overstated his case when he says that it "may be some time before any such controlled inflation is adopted in any country as a deliberate and explicit policy" (p. 122).

innovations," will tend to drive down the real marginal productivity of capital (p. 122).

Patinkin's paper on the quantity theory is, I feel, only of limited interest. The quantity theory, given certain rigid conditions, is held to be correct. Now Keynes always held that classical theory came into its own under full-employment conditions. He laid down two assumptions under which the quantity theory was valid: (1) full employment, and (2) effective demand will change in the same proportion as the quantity of money. This latter condition would be true under *one* of two assumptions: (1) the propensity to hoard is zero; or (2), if not zero, then the liquidity preference schedule, the investment demand schedule and the consumption function are assumed to have such slopes that the aggregate demand will increase in the same proportion as the increase in the quantity of money.

Patinkin, however, argues that two conditions, and only two, are necessary to make the quantity theory valid: (1) full employment, and (2) absence of "money illusion."[20]

Patinkin thinks that his position presents a significant difference between himself and Keynes, but I question that this can be maintained. He admits that Keynes was quite right in insisting that the validity of the quantity theory was connected with the condition that effective demand must increase in the same proportion as the quantity of money. As Patinkin puts it, this latter condition is indeed a necessary consequence of his own crucial assumption with respect to the absence of any money illusion.

Patinkin's chapter, as with everything he writes, deserves the careful attention of economists, and it is possible that I have not done him full justice. At any rate this chapter interests me far less than his earlier very able contributions. With respect to this chapter, and indeed all the others as well, it is far more difficult to assess in a balanced way a book containing chapters by fifteen authors than a book of fifteen chapters by one author. All in all the book is an interesting and useful contribution to post-Keynesian economics.

[20] True, he takes cognizance (as did also the classicals) of the special condition that there must be no distributional effects such as might account for forced saving

COMMUNICATIONS

Elasticities, Cross-Elasticities, and Market Relationships: Comment

Over recent years, a good deal of confusion and inconsistency has grown up around the concept of cross-elasticity of demand, a fact which must have occasioned distress to all those who have attempted to follow the literature of value theory during this period. We are, therefore, all indebted to R. L. Bishop for his valuable and timely article on the subject.[1] In particular, Bishop has rendered us two important services. Firstly, he has provided an admirable survey of the variety of opinion surrounding the concept of cross-elasticity of demand, and has brought into the open the deep cleavages which exist. Secondly, he has recalled our attention to the fundamental fact that "the concepts in question are elasticities and cross-elasticities of *demand*."[2] In this connection, he shows how many writers have attempted to qualify the concept of cross-elasticity by reference to supply factors and directs our attention to "the profound anomalies that are implied by their half-breed supply-demand elasticities."[3] Unfortunately, however, when Bishop embarks upon positive prescription, we find that the basic confusion remains embedded in his own work.

Clearly, if we are to use cross-elasticities to define market relationships, it is essential that we have a clear conception of what they do in fact measure. Otherwise, any superstructure of market classification based upon them will be erected on shifting sands. Therefore, in this note, we shall confine ourselves to the fundamental question: What does cross-elasticity of demand measure?

The concept of cross-elasticity of demand with which we shall be concerned is that of its original sense: the ratio of the percentage loss of output by any firm j to the initiating percentage *reduction* in price by another firm i, all other prices being assumed unchanged; so that $E_{ji} = p_i \partial q_j / q_j \partial p_i$, where p_i is the price of firm i and q_j is the output of firm j, and where ∂p_i is considered in the negative sense.[4] This cross-elasticity is, then, the same as Triffin's first (sub-

[1] "Elasticities, Cross-Elasticities, and Market Relationships," *Am. Econ. Rev.*, Dec. 1952, XLII, 779-803.

[2] *Ibid.*, p. 781. Bishop's italics.

[3] *Loc. cit.*

[4] Strictly speaking, it has not been usual in defining cross-elasticity to restrict the direction of the price-change. However, I believe most readers will accept, without quotation of chapter and verse, that invariably discussion has proceeded, either explicitly or tacitly, in terms of a price-cut. For the rest, it seems to have been assumed automatically that the same characteristics would attach to a rise in price. However, a price-cut involves the reduction of one price in relation to all others, whereas a price-rise implies the reduction of all other prices in relation to one. Where substitution in all directions is not continuous (see the latter part of footnote 10), the symmetry between a price-cut and a price-rise will not generally hold. For a more detailed discussion of this point, see my "A Kinked Demand Curve for Monopolistic Competition," *Econ. Record*, May 1953, XXIX, 19-34.

stitution) coefficient, except that it specifically excludes the case of a rise in p_i.

It should be noticed that this definition of cross-elasticity of demand makes no reference to the supply restrictions which Bishop rightly deplores. Moreover, it is clear that this cross-elasticity, freed from supply qualifications, is a coefficient of substitution. Indeed, this was precisely the purpose of its original introduction by Kaldor.[5] The aim was to provide a more satisfactory criterion of substitutability than that of physical description of the products. It was to meet the difficulty, as Triffin puts it, that "the competition may be keener between Ford and Rogers Peet than between Ford and Rolls-Royce."[6] And certainly this conception of cross-elasticity has persisted in the textbooks, at least in certain chapters of them. Thus, for example, Stigler tells us: "The cross-elasticities provide a convenient index of the readiness with which consumers substitute one commodity for another."[7]

In the classical tradition, it was held (correctly) that two criteria are necessary to define market relationships: (1) a substitution criterion, and (2) a numbers criterion. Triffin (as well as Kaldor, Stigler and others) was clearly correct in using price cross-elasticity as a substitution criterion; and, on this score, Bishop's criticism—that Triffin's interpretation of cross-elasticity is "one-sided" because it takes no account of the "scale of numbers"[8]—completely misses the mark. Indeed, it is from attempts to use price cross-elasticity as a numbers criterion, and in particular to use it as *the* criterion of oligopolistic interdependence, that confusion has inevitably arisen. High cross-elasticities are certainly a *necessary* condition for oligopoly, since price interdependence requires that the products concerned should be good substitutes. But further conditions are needed to satisfy the numbers requirement.

Cross-elasticity of demand as we have defined it, *i.e.*, as it is usually defined, is then, a coefficient of *substitution;* it is not a function of numbers. In fact, the supply restrictions upon cross-elasticities, which Bishop convincingly rejects, were allowed to intrude in the belief, mistaken as we shall see later, that this attached a numbers significance to cross-elasticity of demand. Yet Bishop, having abandoned these quite inappropriate supply qualifications, says: "The truth of the matter, of course, is that the value of E_{ji} depends on *both* the scale of numbers and the scale of product homogeneity-heterogeneity; and consequently it is not a sure clue to either, separately."[9] While this displays a commendable spirit of compromise, the conclusion is not correct. Indeed, if it were correct, then cross-elasticity of demand, not being a unique measure of anything, would have little purpose to serve and might be rejected out of hand.

The cross-elasticity of demand E_{ji} is a measure of the rate at which j cus-

[5] "Mrs. Robinson's 'Economics of Imperfect Competition,'" *Economica* (N. S.), Aug. 1934, I, 335-41; and "Market Imperfection and Excess Capacity," *Economica* (N. S.), Feb. 1935, II, 33-50.

[6] R Triffin, *Monopolistic Competition and General Equilibrium Theory* (Cambridge, Mass., 1941), p. 88.

[7] G. J. Stigler, *The Theory of Price* (New York, 1947), p. 89.

[8] *Op. cit.*, pp. 785-89.

[9] *Ibid.*, p. 787. Italics in original.

tomers will move to product i in response to a reduction in the price i. From the indifference function of each individual j customer, we may deduce the rate at which each such customer will substitute product i for j. By summation, in the manner of the Marshallian demand schedule, we may construct a cross-demand schedule (q_j plotted against p_i) for the product j with respect to the price of product i. This will give us the rate at which j customers as a whole will substitute product i for product j.[10]

But, whereas cross-elasticity of demand is a function of the rate at which consumers will substitute the one commodity for another, own-elasticity of demand depends, not only on the rate of substitution between individual products, but also upon the *number* of substitutes available. After all, as Bishop himself stresses, own-elasticity of demand is a measure of "total substitutability," *i.e.*, the substitutability between the "own" product and the collectivity of products which make up its competitive field. It is surely obvious that any change in the variety or number of products within this competitive field will affect the value of own-elasticity of demand.

Let us pursue this question of the relationship between cross-elasticity and own-elasticity of demand further. For this purpose, we need to make a slight change in our definition of elasticity and cross-elasticity. Usually, elasticities are expressed as a ratio between a percentage price change and a percentage *output* change. However, under differentiated competition, units of ouput, as between firms, are not strictly commensurable. Therefore, instead of output, we now insert *sales*, *i.e.*, output in value terms; and to signify the change we substitute in our elasticities Q_i for q_i. We further suppose that the total value of sales lost by any firm j in response to a unilateral price-cut by i will accrue as additional sales to i. (This assumption is equivalent to neglecting the income effect of the price change.) Then, on this basis, own-elasticity of demand may be readily expressed in terms of the array of cross-elasticities:

[10] Cross-elasticity of demand for an individual consumer, which we may denote by $\bar{E}$, is given by $\bar{E}_{ji} = k_i\sigma - k_i\bar{Y}_j$, where k_i is the fraction of income spent on i, σ is the elasticity of substitution between i and j, and $\bar{Y}_j$, is the income elasticity of demand for product j. (See J. R. Hicks, and R. G. D. Allen: "A Reconsideration of the Theory of Value," *Economica* (N. S.), May 1934, I, 201-2.) Then, if we neglect the income effect as we are entitled to do when only a fraction of income is spent on any one commodity, individual cross-elasticity of demand is a simple function of elasticity of substitution, σ. Firm cross-elasticity is the weighted average of these individual cross-elasticities.

Actually, this is not the whole story, because in conditions of pure monopolistic competition, if I may coin an expression, the process of substitution will not generally be continuous, *e.g.*, as in the case of substitution of one brand of toothpaste for another. Rather, in this situation, there would be a critical price ratio at which total expenditure on the one product (abstracting from income effects) would be shifted to the other. In terms of indifference curves, this case would be represented by a curve of infinite elasticity of substitution, but with a slope (marginal rate of substitution?) different from unity. Here, resort must be had to indirect methods to translate consumer preferences into cross-elasticities. Incidentally, it will be noticed that these cross-elasticities (finite) are more appropriate indices of substitutability than the elasticities of substitution which are infinite. However, this is a digression. My purpose here is only to show that cross-elasticity is directly related to the theory of consumer choice which, of course, is essentially a study of substitution. After all, the concept of cross-elasticity was born in the London School which, at the same time, was also nurturing the neo-Paretian analysis.

$$- E_{ii} = \frac{Q_j}{Q_i} E_{ji} + \frac{Q_k}{Q_i} E_{ki} + \cdots + \frac{Q_n}{Q_i} E_{ni} + \frac{Q_o}{Q_i} E'_{io}$$
$$+ \frac{Q_p}{Q_i} E'_{pi} + \cdots + \frac{Q_s}{Q_i} E'_{si}, \tag{1}$$

where the E_{ji} denote cross-elasticities of the first order of importance and the E'_{oi} denote those of second-order significance.[11]

For convenience, we assume: (1) that the first-order cross-elasticities are all equal, *i.e.*, the $E_{ji} = E_{ki}$, and that the second-order cross-elasticities are all zero; and (2) that all products are substitutes, *i.e.*, none are complementary, so that we may take the arithmetical value of elasticities without ambiguity, and so speak of larger or smaller elasticities without regard to sign. Then, on these assumptions, we may rewrite (1) in the simpler form:

$$E_{ii} = \frac{Q_j + Q_k + \cdots + Q_n}{Q_i} E_{ji} \tag{2}$$

$$\text{or, } E_{ii} = \frac{\text{Non-}i\text{ Output}}{\text{Output of } i} E_{ji} \tag{3}$$

Now, if the concept of numbers means anything in relation to a group, it expresses a relationship between firm output and total group output. If numbers are large, the firm's share in group output is small; and conversely if numbers are few. Then it is easy to see from (3) that any change in firm *i*'s share of group output will, other things remaining the same, involve a corresponding change in own-elasticity of demand, E_{ii}. Take, for example, a decrease in numbers, *i.e.*, an increase in *i's* share of the market. This must necessarily involve a decreased elasticity of demand for firm *i*, since, *ex hypothesi*, the size of the market from which sales may be attracted has contracted in relation to *i's* own output. Although own-elasticity of demand depends on numbers in this fashion, cross-elasticity does not. This is so because the sales lost by any firm *j* in response to a price-cut by another firm *i* are related to the output of firm *j*. Hence, so long as the proportions between *j* customers of various degrees of sensitivity are unchanged, any increase (or decrease) in *j's* share of the market will affect the numerator and denominator of the cross-elasticity ratio in the same proportion.

The reader will not have failed to notice that our equation (3) expresses the same relationship as Bishop's so-called "numbers equivalent" which he writes $-E_{ii} = (n_i - 1)E_{ji}$. Also, it will be clear that the essential difference between

[11] *Cf.* Stigler, *op. cit.*, p. 235: "The group may be defined as all firms whose cross-elasticities are greater than some constant. This constant can best be chosen in any particular problem by ranking the cross-elasticities and considering a group to end where a considerable gap appears in the array of cross-elasticities." Interestingly enough, most economists would accept this procedure. But many do not seem to realize that in accepting this technique, based as it is on the notion of a gap in the chain of substitutes, they are accepting cross-elasticity as a valid substitution criterion.

Bishop's interpretation of this relationship and that given here is that, whereas Bishop treats cross-elasticity of demand as the dependent variable when n_i changes, for us it is own-elasticity which is dependent. Indeed, Bishop's argument always proceeds on the basis: *Given* own-elasticity of demand, then cross-elasticity will be large or small according as numbers are small or large. But, it is fair to ask, by whom or what is own-elasticity of demand given—apart from by the textbooks—except in relation to the closeness and the number of the individual products available as substitutes, the "total substitutability" as Bishop describes it. It is cross-elasticity which measures the closeness of the substitutes and is therefore the natural substitution criterion. Own-elasticity is then determined by the order of the cross-elasticities and the number of them.

This argument is best demonstrated by considering the case of homogeneous competition. In this case, cross-elasticity of demand will be the same whether there are two firms (pure duopoly) or 2,001 firms (pure competition), since cross-elasticity in both situations will be equal to the reciprocal of the percentage price-cut.[12] But own-elasticity of demand for the pure competitor will be much higher than for the pure duopolist. Although, of course, both elasticities may be made as large as we like, if we make the price-cut small enough, elasticity of demand under pure competition will always be much the higher for any given price-cut, however small. Indeed, if the firms in each group were symmetrical, own-elasticity in the pure-competition case would be just 2,000 times that in the duopoly case.[13] It follows as a corollary that, with any given price-cut, we can always make own-elasticity of demand, but not cross-elasticity, as large as we like by making our firm's share of total output small enough, *i.e.*, by making numbers large enough.

At the other end of the scale of substitutability, our interpretation of cross-elasticity is also the natural one. By contrast, Bishop's conception of the relationship between cross-elasticity and own-elasticity leads to paradoxical results when applied to "pure monopoly." In this case, own-elasticity of demand will be finite, while cross-elasticities will be very small or zero. Hence, their ratio—Bishop's "numbers equivalent"—will be very large indeed. And this Bishop frankly confesses, for he says that in this case the numbers equivalent "must be more or less *uniformly* high with respect to all other firms, without exception."[14] At best, this can hardly be said to be a happy choice of terms. Triffin, on the other hand, would describe this situation as one in which the cross-elasticities of demand (measuring the substitutability of products) are more or less uniformly *small*. Surely this is a more apposite description. This becomes obvious as soon as we put the question: Is pure monopoly non-oligopolistic because of the absence of close substitutes (failure of the substitution condition) or because of large numbers (failure of the numbers condition)?

[12] Since for homogeneous competition $\delta Q_j/Q_j$ will always be equal to unity.

[13] It will be remembered that we have excluded supply conditions from our definition of cross-elasticity. Hence, a price-cut by a purely competitive firm must be considered, conceptually, to capture the whole market.

[14] *Op. cit.*, p. 800.

It should be stressed that nothing in the foregoing argument depends on Mrs. Robinson's notion of products "coming closer together" or of new firms "coming in between" old firms, a conception which has been the subject of debate from time to time.[15] Mrs. Robinson, it will be recalled, argued that:

> . . . if the new firms were set up, so to speak, in between the old firms (either geographically or in respect of special qualities which appeal in various degrees to different customers) . . . the difference, from the point of view of buyers, *between any one firm and the next* would thus be reduced, the customers of each firm would become more indifferent, and the elasticity of demand would be increased.[16]

This is a valid argument.[17] But it is important to recognize that there are two effects involved here: not only an increase in numbers per se (the numbers effect), but also a change in the distance between individual products, as is indeed stated in the italicized phrase (the substitution effect).

The conceptual distinction between the substitution and numbers effects becomes clear when we consider that the notion of products "coming closer together" in no way depends on increasing numbers. It could equally well come about, for example, as a result of an all-around reduction in transport costs or of a technically inspired move towards greater standardization of existing products. In these cases, numbers would remain unchanged; but cross-elasticities, and hence own-elasticity, of demand would increase. On the other hand, an increase in numbers need not *logically* imply any change in the degree of substitutability between individual products, as for example when the entry of new firms does not alter the "distance" between any two products, as indeed will always be the case with homogeneous competition.

However, in the real world of differentiated products, a change in numbers will almost certainly involve some rearrangement of consumers' preferences;[18] and hence some change in cross-elasticities of demand. This effect will usually be in the same direction as, but remains conceptually distinct from, the numbers effect. The important fact is that cross-elasticities change, not in virtue of the change in numbers as such, but because of the change in substitutability which will usually be *associated with* a change in the product-structure of a group.

It is from confusion of these two effects, it seems to me, that has arisen the

[15] In particular, during the 1938 debate between Chamberlin and Kaldor in the *Quart. Jour. Econ.*

[16] Joan Robinson, *Economics of Imperfect Competition* (London, 1933), p. 101. My italics.

[17] *I e*, given Mrs. Robinson's condition: "If the new firms were set up in between the old firms." The fact that an increase in the numbers of firms *may* involve merely an increase in area and not in density—a point made much of by Chamberlin—is irrelevant to the *particular* argument in question.

[18] Strictly speaking, an increase (say) in the number of firms will not of itself alter consumers' preferences *as between* the old products. Rather it will establish between the old firms and the new firms, and between the new firms themselves, a new set of cross-elasticities, which may be larger or smaller than existing cross-elasticities. (In Mrs. Robinson's example they will, of course, be larger.) Nevertheless, the change in numbers will imply some redistribution of consumers between firms and this will, in general, affect the pre-existing cross-elasticities also.

"third force" view, as represented by Bishop, for example, that cross-elasticity is a function both of product substitutability and numbers. The clear implication of this view is that the effect of a change in numbers upon cross-elasticity cannot be theoretically determined, but is an empirical question only to be answered by reference to the facts of any given situation. But this approach is theoretically misleading. In so far as a change in the number of firms (products) changes the opportunities for substitution and the pattern of consumer attachments, it changes the pattern of cross-elasticities. But the important point is that it changes cross-elasticities via changes in substitutability or, if you like, via changes in the complex of consumers' preferences which theory has almost universally taken as data. However, there is no essential connection between such changes and changes in numbers in the sense used throughout this paper and by Bishop. This latter conception of numbers relates to the ratio of firm to group output, and changes in this ratio may clearly occur independently of any change in consumers' scales of preference.[19]

Since the matter is of fundamental importance for formal analysis, perhaps it is well to attempt to pinpoint the source of the long-standing confusion of cross-elasticity with numbers. In the old scheme—when commodities were different in kind, not merely in degree—numbers were determined as a simple arithmetic relationship between the capacity of any one firm and the total market supply of the commodity in question. Thus, if a firm's capacity were small compared with total output, the situation would be one of pure competition, because any additional supply it could add to the market would, when "spread over" that market, affect other suppliers only to a negligible degree. On the other hand, if a firm's potential capacity were large in relation to total supply, oligopolistic implications would arise.

This conception was adapted by Chamberlin to the general case of monopolistic competition. Thus, in a formulation which he still finds "unobjectionable,"[20] he defined the "large group" as follows:

> Specifically, we assume for the present that any adjustment of price or of "product" by a single producer spreads its influence over so many of his competitors that the impact felt by any one is negligible and does not lead him to any readjustment of his own situation.[21]

It is but a short step from here to those "half-breed supply-demand cross-elasticities" which Bishop denounces, a step, incidentally, that Chamberlin himself

[19] Perhaps the distinction is best made clear by an illustration. Imagine that a sectional increase in i customers' incomes results in a doubling of purchases from firm i, the outputs of all other firms in the group and the whole complex of consumer preferences remaining unchanged. Own-elasticity of firm i will approximately halve. By contrast, the cross-elasticities will not be affected, except in so far as the alteration in income shifts the margin at which substitution takes place. Since, when we speak of substitutability, we mean substitutability at the margin, there is clearly a sense in which we may take cross-elasticity, but cannot take own-elasticity, as data given by the total map of consumers' preferences.

[20] A Comment on Bishop's article, *Am. Econ. Rev.*, Dec. 1953, XLIII, 913.

[21] *Theory of Monopolistic Competition*, 3rd ed. (Cambridge, Mass., 1938), p. 83.

seems to have taken in his more recent work.[22] It would take me too far from the present purpose to discuss here the validity of Chamberlin's formula as a numbers criterion. But I do wish to dispute its relevance to the concept of cross-elasticity of demand.

Let us consider Chamberlin's formula in terms of a price-cut. Now it is clear that we must invoke some sort of supply restrictions if we are to make any sense at all of his conception of the effect of a price-cut being "spread over" a given number of rival firms. This is so because, theoretically, we can make the increment of sales to the price-cutting firm, and therefore the amount to be taken from rivals, as large (small) as we like if we make the price-cut large (small) enough. This follows immediately from the fact that, *ex hypothesi,* the relationship between a price change and a quantity change under conditions of monopolistic competition is always a *finite* one. Therefore, the increment of sales accruing to a price-cutting firm, and hence the amount taken from each rival, cannot be determined, unless appeal is had to some consideration of supply.[23] Now it is possible to argue that the amount by which a "large group" seller may increase sales is limited by supply factors. But, the smaller is a firm's potential capacity, the smaller need be the price-cut to take up this capacity; and since cross-elasticity of demand is the ratio of the quantity change to the price change, its value will not be affected by any considerations of supply.

It is perfectly true, of course, that, with given rates of substitution, the greater the *number* of competitors, "the less the price reduction necessary to secure any desired increase in the sales of A . . . And . . . the less the effect of any given increase in the sales of A on the sales of rival products. . . ."[24] However, since the effect of (say) greater numbers is (1) to reduce the price-cut required to achieve any predetermined result; and (2) to reduce the amount which it is necessary to take from any individual competitor, the cross-elasticities of demand are unaffected, because the numerator (percentage sales loss) and the denominator (percentage price-cut) are changed in the same proportion. Hence, *cross-elasticity of demand is independent of numbers.*

Since the idea of cross-elasticity as a measure of substitutability seems simple and straightforward enough, or at least so it has appeared to a good many writers, it may well be asked why its general adoption has been so strenuously resisted. The answer, I believe, is to be found in the implications which stem from its acceptance.

[22] For example, "Measuring the Degree of Monopoly and Competition," a contribution to *Monopoly and Competition and Their Regulation*, E. H. Chamberlin, ed. (London, 1954), esp. Pt. 4, pp. 262-67. More recently, however, he has retreated from this position and reverts to his original definition of isolation which I have quoted in the text above. He now says, "It should be noted that zero cross-elasticities, though sufficient, are not necessary to isolation in this sense; and also that in the vexed case of pure competition, *however one may rule as to the value of the cross-elasticity coefficient,* a single seller is isolated in the sense described." (Comment on Bishop's article, *op. cit.*, p. 913.) In short, he now admits there is no necessary relation between his large-small numbers criterion and cross-elasticity of demand.

[23] Bishop is overgenerous in saying that attempts to qualify cross-elasticities with supply restrictions have been confined to homogeneous competition. *Op. cit.*, p. 781.

[24] G. J. Stigler, *op. cit.*, p 235.

The argument advanced in this paper is essentially the same as that put forward by Kaldor in the 1938 controversy with Chamberlin. During that debate, it will be recalled, Kaldor regarded as "crucial" the proposition that "a shift of the [demand] curve to the left will increase the elasticity of demand at the equilibrium level of output. . . ."[25] And since such a shift to the left is associated with an increase in the number of firms, the "curves become more and more elastic with an increase in numbers. . . ."[26] Chamberlin rejected this proposition and reiterated his opposition to the idea that "differentiation of the product (in my sense) may be exorcised by the process of merely increasing the number of firms."[27]

Chamberlin was perfectly correct in asserting the latter, as he was wrong in rejecting the former, for it is clear that, no matter how small may become the output of a firm as the result of increasing numbers, there may still be a proportion, and even a constant proportion, of customers who will be prepared to continue paying something more for the product of that particular firm than for any of its substitutes. Product differentiation remains; and upwards elasticity of demand, *i.e.*, elasticity in respect of a price-rise, does not necessarily increase as output contracts in relation to group output. Indeed, as output contracts the firm may be left with only a hard core of its most loyal customers. Elasticity to a price-raise may actually decrease.

Thus, we arrive at the position where, as a firm's output contracts in relation to group output, its downward elasticity, E^d, increases (*vide* Kaldor), while its upward elasticity, E^u, may be constant or even decreasing (*vide* Chamberlin). And both points of view are correct. The seeming contradiction, which has persisted from the 1938 debate to Bishop's work in 1952, is only a contradiction so long as we cling to the preconception, which has no real basis except in the economist's penchant for simple stable equilibria, that E^d should approximate to E^u, *i.e.*, that the demand curve under differentiated competition should necessarily be smooth.

On a subject pregnant with misunderstanding, it is perhaps well to conclude by stating briefly what is *not* implied in my argument here. Firstly, although I have argued that Triffin's use of price cross-elasticity as his substitution criterion is, with the qualification mentioned, unexceptionable, I would not be prepared to accord the same support to his numbers criterion. The so-called "quantity cross-elasticity" by which he distinguishes between large and small numbers is purely definitional. At no point does Triffin postulate the conditions of demand or supply that determine the value taken by his numbers coefficient. Secondly, in so far as the degree of monopoly or competition may be expressed in terms of elasticities of demand, which is certainly not so in the case of oligopoly for instance, I believe it is own-elasticity, measuring total substitutability, which is the appropriate index. I would agree with criticisms of Triffin's suggested use of cross-elasticity in this connection. It should, I think, occasion

[25] N. Kaldor, "Professor Chamberlin on Monopolistic and Imperfect Competition," *Quart. Jour. Econ.*, May 1938, LII, 518.

[26] *Loc. cit.*

[27] Reply to Kaldor, *Quart. Jour. Econ.*, May 1938, LII, 531.

no great surprise that a measure of monopoly or competition which involves both substitutability and numbers is more appropriate than one merely measuring substitutability.

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Reply

With respect to my own article, the principal issue raised by Hieser's interesting paper concerns the comparative merits of E_{ii} and E_{ji} as indices of the homogeneity or heterogeneity of products. In commenting on this question, I shall limit my discussion for the most part to the very special case of isolated, symmetrical groups of n rival firms.

In such cases, Hieser and I agree that the ratio $-E_{ii}/E_{ji} = n-1$ reflects the "numbers" criterion to at least a fair approximation (p. 376). We also agree that the classification of market relationships requires a "substitution" criterion as well. We differ, however, in that I prefer the own elasticity E_{ii} for this purpose, while Hieser prefers the cross-elasticity E_{ji}. At bottom, this difference between us is definitional; but it is well worth debating which definition is the more useful analytically. For my part, I acknowledge that the cross-elasticities E_{ji} and E_{ij} indicate the substitutability between the ith and jth products; and Hieser seems to agree, in turn, that E_{ii} reflects what I called the "total substitutability" between the ith product and all others taken together—or all others within the relevant group when there is no significant substitution between the ith product and others outside that group (p. 375). We would further agree, I take it, that both "total substitutability" and the "individual substitutability" between pairs of products have their own respective significances. It remains, therefore, for me to indicate my reasons for preferring E_{ii} as the more useful substitution criterion for the specific purpose of classifying market relationships. I am especially grateful for the opportunity to do so; for Hieser's note has made me belatedly aware that I have never given anything like a complete explanation of my choice in this respect.

In reply to the first round of criticisms of my article, it was necessary for me to emphasize that a remarkably close approach to pure competition is consistent with very *large* magnitudes of E_{ji}, provided only that $-E_{ii}$ is all the larger—such that $-E_{ii}/E_{ji} = n - 1$ is also large.[1] At the same time, I also observed that "cross-elasticities are not *necessarily* high in atomistic competition."[2] This goes to the heart of the question as to the relative merits of E_{ii} and E_{ji} as the preferred criterion of product homogeneity or heterogeneity in the context of market classification. I must now emphasize that a remarkably close approach to pure competition is also consistent with very *small* cross-elasticities, provided that $-E_{ii}$, while itself very large, is small relative to n—such that $-E_{ii}/(n-1) = E_{ji}$ is small.[3]

[1] "Reply," *Am. Econ. Rev.*, Dec. 1953, XLII, 916-17.

[2] *Ibid.*, p. 917, n. 2 (original italics).

[3] There is a quite intriguing symmetry—and complementarity—between this reply and my former one. There I had to defend my "numbers" criterion against the view, originally taken by Chamberlin among others and subsequently maintained in a somewhat different

Suppose, for example, that there are 1,000,001 firms in an isolated, symmetrical group, and that each $E_{ii} = -5{,}000$. For all practical purposes this hypothetical industry is a purely competitive one, because n is very large and the other-prices-constant demand facing each individual firm has an elasticity hardly distinguishable from infinite. Yet $E_{ji} = -E_{ii}/(n-1)$ is .005! With still higher numbers and the same E_{ii}, obviously, cross-elasticities can be made indefinitely small.

Now, if E_{ji} is specified as *the* measure of "substitutability," in accordance with Hieser's preference, it must at least be conceded that a situation can closely approximate pure competition even though the products of *pairs* of rival firms are only very weakly substitutable. In short, while high *total* substitutability is a necessary condition in order that pure competition may be closely approached, high *individual* substitutability is not. True, we speak of product "homogeneity" as a necessary condition for pure competition; but, in my view, the relevant version of that concept concerns the substitutability among *all* the products in the relevant group, rather than that between merely successive pairs of them. That is why I prefer to specify the "homogeneous-product" requirement of pure competition (and pure oligopoly) in terms of a high magnitude of E_{ii}, rather than in terms of E_{ji}.[4]

Similarly, when products are significantly heterogeneous or differentiated, this also seems to me to be most reliably reflected by the moderate or low absolute magnitudes of E_{ii}. Consider, for example, a symmetrical, isolated group of three oligopolists, such that each $E_{ii} = -10$ and each $E_{ji} = 5$. To me, this is a significantly *differentiated* oligopoly, because E_{ii} is significantly different from infinity. In particular, I would say that there is a much lower degree of product homogeneity in this industry than in the all but purely competitive one where every $E_{ii} = -5{,}000$. Yet Hieser would have to classify this significantly differentiated oligopoly (with $E_{ji} = 5$) as exhibiting a much *greater* degree of product homogeneity than the above situation of near-pure competition (with $E_{ji} = .005$). In my contrasting view, this species of three-

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form by Fellner, that numbers—and, more generally, the distinction between the presence and absence of oligopoly—are reliably reflected by the magnitude of E_{ji} alone. I am pleased to have Hieser with me on that phase of the argument; and I am also pleased to have his support for Triffin's view and my own—as against Chamberlin and others—that supply restrictions should not be allowed to intrude on the elasticity concepts used in market classification. At the same time, it is Chamberlin and I who are arrayed against Hieser and Triffin as to the relative merits of E_{ii} and E_{ji} as the preferred measure of the degree of heterogeneity of products.

[4] To be sure, if the products of a *given number* of rival firms are visualized to become more and more nearly homogeneous, both E_{ii} and E_{ji} go to infinity—precisely because their ratio—$E_{ii}/E_{ji} = n - 1$, remains constant. Hence, when products are strictly homogeneous, it would not matter whether we specify that condition as implying infinite E_{ii} or infinite E_{ji}. That is why I refer to instances of only near-homogeneity to weigh the comparative merits of the two coefficients as the preferred measure of this aspect of the classificatory problem.

On the other hand, if we visualize *both* $-E_{ii}$ and n as approaching infinity, E_{ji} may be anything at all between zero and infinite—as I also pointed out in my "Reply," *op. cit.*, p. 920. This again emphasizes that a large E_{ji} is not a necessary condition as pure competition is merely approached.

firm oligopoly would not exhibit as high a degree of product homogeneity until $E_{ii} = -5{,}000$ (with $E_{ji} = 2{,}500$).[5]

While definitions are never right or wrong, but only more or less useful, I do feel that Hieser's fails to accord with the practical distinction that the market classifier wishes to make between substantially homogeneous and significantly differentiated products. At the same time, I should like to acknowledge the paradoxical aspects of the matter. If only because there is a strong tendency to think of substitution as taking place between just *pairs* of products, E_{ji} does have a certain commonsense priority as a measure of substitutability. On the other hand, if E_{ji} is to be used in classifying market relationships, at the very least its *significance* as a measure of product homogeneity or heterogeneity within the relevant group requires the additional consideration of the number of firms with which the *i*th firm experiences similar cross-elasticity magnitudes.[6] This difficulty is avoided if the concept of total substitutability is used in the first place. This seems to me to be the better choice, both because market relationships involve much more than just the relationships between pairs of firms, and because—for the purpose of market classification—we are less interested in the substitutability between pairs of products than in some measure of the homogeneity or heterogeneity of products as supplied by the entire group of firms that make up any given firm's competitive field.

When Hieser finds a "basic confusion" in my proposals (p. 373), I do not understand him to be accusing me of any error of either fact or logic. Rather my transgression is that of preferring my own measure of substitutability to his. The same thing is true when Hieser characterizes as "not correct" my statement that "the value of E_{ji} depends on *both* the scale of numbers and the scale of product homogeneity-heterogeneity" (quoted above, p. 374). This would indeed have been incorrect if I had chosen E_{ji} as my measure of the homogeneity or heterogeneity of products. Actually, of course, I chose E_{ii}; so my conclusion still stands with respect to my own definition—as in the expression, $E_{ji} = -E_{ii}/(n-1)$.

Since Hieser and I agree as to the approximate validity of the equation, $-E_{ii}/E_{ji} = n - 1$ (or the "numbers equivalent," $n_i - 1$, when groups are either asymmetrical, imperfectly defined, or wholly amorphous), it seems to me pointless to argue whether "large numbers" imply a high value of $-E_{ii}$

[5] Naturally, the fact that this industry is oligopolistic rather than atomistic also implies that the other-prices-constant demand facing any one of the three firms (with E_{ii} is in some rigid sense a "dependent variable" (p. 377). While I did make use of the price-output decisions—any more than the other-prices-constant demand with $E_{ii} = -10$ will be the relevant one in our significantly differentiated oligopoly. The other-prices-constant demand function, on which both Hieser and I base our classificatory elasticities, closely approximates the demand relevant for the individual firm's decision-making only in nonoligopolistic situations.

[6] Indeed, Hieser seems to be at least on the verge of conceding this, in the sentence that includes the first part of the quotation from Stigler (p. 380). On the other hand, when he asserts with the emphasis of italics at the end of the same paragraph that "*cross-elasticity of demand is independent of numbers*," I must again reply that it has no classificatory significance in distinguishing near-homogeneous products from significantly differentiated ones except in conjunction with numbers. To the extent that the italicized assertion is intended to have *empirical* validity, I shall comment on that question in just a moment.

or a low value of E_{ji}.[7] Similarly, I do not wish to commit myself to any hard and fast theory as to the actual effect on the E_{ii} and E_{ji} magnitudes of any *change* in the number of active firms in a particular industry.[8] It is true that I used phraseology such as this in my article (p. 786): "For any given value of E_{ii}, the larger is n . . . the smaller is E_{ji}." Again (p. 798), I spoke of the implications for E_{ji} "as differentiated products with given substitutability [*i.e.*, with given magnitudes of E_{ii}] are produced by larger and larger numbers of firms." But I also referred to this assumed constancy of E_{ii} as an "artificial assumption" (p. 798, n.); and in the remainder of that footnote I briefly indicated reasons why E_{ii} might actually be expected to increase and E_{ji} to decrease when the number of firms increases in some particular industry.[9]

More generally, such effects will obviously depend on the particular causes of the increase in the number of firms and the particular details of the consumers' tastes for the changing number and variety of available products. Hieser does not explicitly reject this view—indeed, he makes some concessions to it; but he also characterizes it as "theoretically misleading" (p. 379), on the ground that "a change in the number of firms . . . changes cross-elasticities via changes in substitutability." In Hieser's own terminology, however, this proposition is a definitional tautology; for he defines and measures substitutability only in terms of cross-elasticities. In the same context, Hieser also seeks to equate given consumers' preferences with given cross-elasticities but not with own elasticities. In my own view, all of the E_{ii} and E_{ji} coefficients are exactly on a par as given aspects of any given situation.

One possibility, I concede, is that the E_{ji} magnitudes might remain the same as numbers change. But even if this were always so as an empirical matter, it would not affect in any way—as I see it—the relative merits of E_{ii} and E_{ji} as the more useful classificatory measure of product homogeneity or heterogeneity. In other words, mere market classification, with which I was exclusively concerned, requires no special theory of the comparative statics of

[7] The same issue is also involved when Hieser expresses misgivings as to the implication that, in "pure monopoly," the numbers equivalent must be high with respect to all other firms (p. 377). Apart from the one-member group that the pure monopolist himself comprises, he belongs to no significant group other than that comprising all the firms in the whole economy. But we must still assure ourselves that the presumed "purity" of the monopoly is not compromised by any threat of oligopolistic interdependence with any other firm. It is then a matter of complete indifference, it seems to me, whether we state that condition in terms of uniformly high values of $-E_{ii}/E_{ji}$ or in terms of uniformly low values of $-E_{ji}/E_{ii}$. The former version suggests, at least by analogy, that the pure monopolist is a member of a large-number group embracing all firms in the economy, while the latter implies that he bulks small in the economy as a whole. In this case, furthermore, E_{ji} must itself be very small, since $-E_{ii}$ would always be no more than moderately large (significantly different from infinite) as an empirical matter.

[8] Thus I also wish to disavow explicitly the notion, which Hieser attributes to me, that E_{ji} is in some rigid sense a "dependent variable" (p. 377). While I did make use of the equation $E_{ji} = -E_{ii}/(n_i - 1)$ to show how cross-elasticity was related to both "total substitutability" and "numbers," I regard this equation as perfectly interchangeable with such transformations as $-E_{ii}/E_{ji} = n_i - 1$ (which I also used) and $-E_{ii} = (n_i - 1)E_{ji}$ (which Hieser prefers).

[9] In that footnote, unfortunately, there is a misprint: "*i*th" in the next-to-last line should be "*j*th."

actual changes in the numbers of rival differentiated products. It seems to me that Hieser confuses these more ambitious empirical questions with the quite separate problem of just classifying the alternative market relationships that may exist in any given situation. After all, the classificatory problem involves nothing more than identifying certain strategic coefficients that will be consistently related to those aspects of market relationships in which we are analytically interested.[10]

Hieser also believes that, in groups of firms supplying differentiated products, the other-prices-constant demand facing each firm will typically exhibit a highly distinctive kink—such that the downward elasticities (both own and cross) will markedly exceed the upward elasticities. Feeling that Hieser is quite fundamentally mistaken about this, I wish I might discuss the question at the length that it would require. Moreover, this is an issue of greater substantive and empirical significance than the one that I have discussed. But it is also a quite separate question; and limitations of space forbid my pursuing it at this time. Suffice it to say that my foregoing discussion may be interpreted as applying, from Hieser's point of view, to the downward elasticities only, or—when demands are smoothly continuous—to both upward and downward elasticities.

ROBERT L. BISHOP*

[10] For this reason, incidentally, I am somewhat puzzled that Hieser should criticize adversely one (but only one!) of Triffin's coefficients as being "purely definitional" (p. 381). The only relevant criticism of any such coefficient, it seems to me, must be based on whether it consistently reflects what it is supposed to reflect.

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The Growth of American Unions: Comment

In a recent article in this *Review*[1] Irving Bernstein advanced persuasive argument, supported by considerable historical evidence, in support of the contention that the future of the American labor movement is quite bright. He cited figures to show that the trend of membership of organized labor was steadily upward during the period 1897 to 1953, not only in absolute terms, but also relative to the increase in the size of the total civilian labor force. This secular trend in "real membership" (membership as a percentage of the civilian labor force) is explained by the operation of four factors: the expansion of the labor force, the growing social acceptability of trade unionism, increasing homogeneity in the working force, and the extension of collective bargaining provisions for union security. His investigations led him to believe that these same four factors are likely to be operating in the future, assuring that organized labor will "grow steadily in the long run." It is apparent that to "grow steadily in the long run" encompasses a very wide range of possibilities, but it is clear from the entire context of the article that Bernstein is optimistic concerning the prospects for the future growth of organized labor. Bernstein also analysed the relation of the business cycle to union growth, and concluded that unionism will "suffer little or no loss in bad times."

[1] I. Bernstein, "The Growth of American Unions," *Am. Econ. Rev.*, June 1954, XLIV, 301-18.

The writer does not contend that Bernstein's inferences with respect to the future growth of organized labor are necessarily incorrect, but in the absence of more adequate analysis than that presented in this study he finds it difficult to accept them with the same degree of confidence as Bernstein. It is quite possible that certain weaknesses in Bernstein's analysis may have misled him into an overoptimistic appraisal.

In his analysis of the growth of the American labor movement Bernstein was concerned entirely with the determinants of the long-run trend and failed to consider the special circumstances which may have conditioned the growth during particular periods. This was especially unfortunate with respect to the period 1933 to 1946, since the highly favorable environment making possible the phenomenal growth of organized labor during these years is unlikely to exist again in the future. By 1933 the stage was set for a great union advance. Population growth and industrialization had created a pool of millions of industrial workers, largely concentrated in the urban centers, and for reasons that are well known these workers were almost entirely unorganized in 1933. Thus a tremendous potential existed at the beginning of this period. Within the climate of opinion toward group action created by the psychological impact of the depression, industrial unionism and the protection of a benevolent government provided the immediate stimuli for union growth. As a result, millions of workers flocked into the unions. The industrial expansion during the second world war created additional millions of jobs in those industries which lend themselves readily to organization, or which were already highly organized, thus providing further impetus to the union movement. In the postwar period, however, the labor movement has lost its momentum. Those segments of the labor force most susceptible to organization had by 1946 been fairly well exploited, and the postwar campaigns to penetrate those areas and those labor groups less amenable to unionization have met with only very limited success.

The great expansion of employment in the construction industry and in other industries which lend themselves readily to organization has made possible continued growth in the postwar period; however, since the membership increases have been concentrated primarily in these industries, the over-all increase has not been impressive. According to the estimates of the Bureau of Labor Statistics, membership in labor organizations rose from 15 million to between 16½ and 17 million, an increase of only two million or less, during the period 1946-53.[2] During this same period employment in nonagricultural industries increased by 8.5 millions. This experience is in sharp contrast to the war years (1940 to 1945) when organized labor drew 5.9 million additional members into its ranks while employment in nonagricultural industries rose by only 6.2 millions.[3] If the estimates of the Bureau are accepted as a reasonable approximation, the conclusion seems inescapable that a future large-scale union advance will be unlikely unless organized labor is successful in pene-

[2] Membership figure for 1946 from Bureau of Labor Statistics, *Brief History of the American Labor Movement* (Washington, 1947), p. 17 Membership figure for 1953 from BLS, *Directory of Labor Unions in the United States, 1953* (Washington, 1953), p. 2.

[3] Data for employment in nonagricultural industries from *Fed. Res. Bull.*, Apr. 1954, XL, 396. Figure for union membership increase from *Brief History of the American Labor Movement, op. cit.*, pp. 17-19.

trating the main citadels of the unorganized groups—*i.e.*, the write collar employees, the trade and service employees, the employees in the smaller firms, the southern workers outside of Richmond and Birmingham, etc. The fact that organized labor has evidenced little ability to expand in these directions in the postwar period indicates that union growth in the future is likely to be slow.

In his discussion of the factors shaping the size of the American labor movement Bernstein failed to consider the long-run changes in the structure of the economy and the consequent changes in the locational and occupational structure of the labor force. As indicated above, these structural changes were one of the most important factors making possible the great union expansion from 1933 to the end of the war. There is, however, no reason to suppose that future structural changes will be so fortuitous from the standpoint of organized labor. The increasing complexity of our industrial system, the expansion of governmental functions, and rising real incomes are bringing about a decline in the manual segment of the labor force, that segment which has furnished the only fertile field for the union organizer. The South, and other areas of anti-unionism, have been expanding industrially relative to those areas which are more congenial to organized labor. The ultimate result of this development may be to lessen greatly the currently strong and widespread anti-union sentiment in these areas, but there is no assurance that this will be the case. A trend toward wide decentralization of industry in the not too distant future is a definite possibility. By shifting industry toward the smaller communities, such a development would increase substantially the organizational problems of the unions. These few examples of possible future developments suffice to indicate the fallacy of assuming that future structural changes will benefit, or will not be detrimental, to organized labor. It is possible, and in the writer's opinion probable, that they will create a continuously less favorable environment for the unions. In any case, conclusions concerning the future growth of the American labor movement based upon an analysis which does not include consideration of this important factor do not warrant a high degree of confidence.

In drawing upon historical evidence to support his contention that unionism "will suffer little or no loss in bad times" the author fails to consider the fact that, in comparison with past decades, a very much higher percentage of union members are now concentrated in those very industries which are most subject to cyclical decline. In 1950, the United Automobile Workers, Steelworkers, and Machinists alone comprised nearly 20 per cent of the total of organized labor, and these same three unions were responsible for over one-third of the total increases in membership which occurred from 1948 to 1953.[4] Also at present a much higher percentage of total membership is made up of workers in the unskilled and semiskilled groups than was true during most of the period under study by Bernstein. These workers are not as likely as skilled workers to retain their membership during periods of layoff. It seems reasonably certain, therefore, that a major decline in the level of business activity would substantially reduce union membership. Even the relatively mild and short-lived recession of 1949 reduced union membership by 200,000.

[4] Source: Bureau of Labor Statistics, *Directory of Labor Unions in the United States, 1949*; BLS, *Directory of Labor Unions in the United States, 1953.*

Future events may confirm Bernstein's optimistic predictions concerning the future growth of organized labor, but on the basis of available evidence it appears more likely that organized labor's advance for some time in the future will be slow. The rate of increase in total membership over the long run is unlikely to equal the rate for the postwar period, with actual setbacks occurring during periods of declining business activity. The future is, however, very uncertain and any conclusions must necessarily be highly qualified and tentative.

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The Growth of American Unions: Comment

The most challenging conclusion in Irving Bernstein's recent article[1] is that "The conventional monocausal explanation for fluctuations in union membership, the business cycle, is without general validity." Bernstein attempts to show statistically that neither cyclical movements as a whole nor leading components of the cycle (specifically consumer prices, employment, wholesale prices, and industrial production) correlate significantly with unionism. He further concludes that cyclical changes are "useless" in understanding secular expansion in union membership and only sporadically helpful in respect to short-term changes.

On the affirmative side, Bernstein summarizes his findings as follows:[2]

> A multicausal system (including the cycle) is necessary to account for the rise of trade unionism. The primary forces that have shaped secular growth are the expansion of the labor force, growing social acceptability of unionism, increasing homogeneity in the working class, and extension of collective bargaining provisions for union security. In the short run membership has expanded sharply as a consequence of wars and very severe depressions. Unions, in other words, have been the beneficiaries of disaster.

Although we do not quarrel fundamentally with Bernstein's pluralistic explanation of union growth, our analysis leads us to conclude that he has minimized unduly the importance of the cycle in a multicausal system. We have assumed, as does Bernstein, that the business cycle may be adequately represented by the four series: cost of living (consumer prices), employment, wholesale prices, and industrial production. Bernstein found no meaningful relationship between "real" union membership (*i.e.*, the number of union members corrected by the size of the labor force) and any of the four economic factors cited.

In our investigation, we deemed it more reasonable to examine the relationship between the growth of unions during a given time period with the characteristics of the business cycle *during the previous time period* rather than, as in Bernstein's analysis, for the same time period. A time lag is reasonable because on the downturn union members rarely fall away at once and on the upturn it takes time to launch organization drives to attract new members and regain former members.

[1] *Am. Econ. Rev.*, June 1954.

[2] *Ibid.*, p. 317.

When a time lag of one year is used, the results are statistically significant. This is shown in the analysis given below.

Let Y_t = change in union membership during time period t,
X_{1t} = change in cost-of-living index during time period t,
X_{2t} = change in employment during time period t,
X_{3t} = change in wholesale price index during time period t,
X_{4t} = change in industrial production index during time period t.

Since the changes in the business cycle during a given time period must be characterized by all four values of X_{1t}, X_{2t}, X_{3t} and X_{4t}, the relationship may be investigated by using a multiple regression model. Let

$$Y_{t+1} = a_0 + a_1 X_{1t} + a_2 X_{2t} + a_3 X_{3t} + a_4 X_{4t}.$$

Using the data presented in the Bernstein article, the following estimated relationship may be obtained.

$$Y_{t+1} = 1.577 + \underset{(.45)}{.805 X_{1t}} + \underset{(.80)}{.207 X_{2t}} - \underset{(.33)}{.188 X_{3t}} + \underset{(.19)}{.253 X_{4t}}$$

The numbers below the regression coefficients are the standard errors of the regression coefficients. On the basis of these standard errors, it appears that the relationship between changes in union growth is not very strongly related to *any one* of the changes in the individual characteristics of the business cycle. However, changes in the cost-of-living index and changes in industrial production individually seem to bear the strongest relationship to changes in union growth.

In order to evaluate the *joint* relationship between the changes in the four characteristics of the business cycle and changes in union growth, the multiple correlation coefficient has been computed. We find that R = .481 and this is significant at the 5 per cent level. This indicates that there is a relationship between changes in the growth of unions during a given time period and changes in the four variables related to the business cycle during the *previous* time period when all of these variables are considered at the same time.

The foregoing analysis does not purport to show that the growth of unions may be completely explained by business cycles. However, it indicates that business cycles are an important factor in explaining union growth and casts serious doubt on the conclusion that cyclical movements and their leading components are "useless" for an understanding of union growth.

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Reply

Both these comments express views that appear to differ from mine primarily in emphasis rather than in content. Hence the remarks here run the

risk of exaggerating the area of disagreement, because I shall deal only with substantive differences, starting with Fristoe.

In part, Fristoe may be classed as a "saturationist." This view, in essence, holds that the American labor movement stopped growing at the end of the second world war. The readily organizable areas had been cracked and only tough nuts remained—the white collar worker, the small town, the South, etc. My fundamental objection to this argument has already appeared in the article that led off this controversy and there is no need to repeat. Hence I shall comment now only upon matters not dealt with there.

The first point concerns Fristoe's citation of Bureau of Labor Statistics' estimates of union membership in 1946 (15 million) as compared with 1953 (16½ to 17 million). These figures, it should be noted, are not collected by the Bureau and "are not to be construed as data verified by Government."[1] The 1946 figure (14,974,000) is grossly in error because it estimates CIO membership at 6 million. As is well known, CIO has never revealed its actual membership and the 1946 figure is inflated by about 2 million. By deducting this amount, the result closely approximates Wolman's estimate of 12,980,000. The person formerly responsible for the BLS figure has herself reported 1946 membership (including Canadian) at 13,800,000.[2] The actual rise in the period 1946-1953, therefore, was in the neighborhood of 4 million rather than 2 million.[3]

The second comment deals with what Fristoe calls "the main citadels of the unorganized groups"—white collar, trade and service, small firms, and the South "outside of Richmond and Birmingham." The military image is unfortunate since workers in these areas, though more difficult than others to organize, hardly constitute a fortress against unionism. For the white collar and trade-and-service groups the excellent California statistics are suggestive, though, unfortunately, the series covers only the four years, 1950-1953. The 1,577,900 union members in the state in 1953 were divided between 522,000 in manufacturing (33.1 per cent) and 1,055,900 in nonmanufacturing (66.9 per cent). The industry groups in which white collar and trade-and-service employment predominates had the following number of members in 1953: public utilities (60,700); trade, wholesale and retail (185,400); eating and drinking places, hotels and other lodging places (93,600); motion picture production and distribution, theatres and other entertainment (76,400); miscellaneous services (86,400); and government (49,400). Together they totaled 551,900, or 35 per cent of all members. Further, there is evidence that membership in these groups has been increasing; between 1950 and 1953 it advanced 66,200 or 13.6 per cent.[4]

The notion that small firms are more difficult to organize than large is suspect on its face. Sophisticated students of the labor movement a generation

[1] *Statistical Abstract of the United States, 1954*, p. 235.

[2] F. Peterson, *American Labor Unions* (New York, 1952), p. 62. She reports unbroken growth between 1946 (13,800,000) and her terminal year, 1951 (15,300,000).

[3] The 1953 BLS estimate for the labor movement as a whole is not based upon an inflated CIO figure.

[4] State of California, Department of Industrial Relations, *Union Labor in California, 1950*, p. 13 and *Union Labor in California*, 1953, p. 11.

ago argued precisely the opposite in explaining the failure of the AFL in the mass-production industries. The extraordinarily high level of organization in the San Francisco Bay area, where there are no large firms excepting branch plants of nationwide corporations, is an obvious illustration to the contrary. Even more to the point, however, are the statistics of the National Labor Relations Board in collective bargaining elections. In the fiscal year 1953, for example, the Board conducted 6,050 of these representation elections. Of the 1,368 elections involving units with fewer than 10 employees, unions won 76.7 per cent; of the 3,884 involving fewer than 50, unions won 72.9 per cent; of the 4,720 involving fewer than 100, unions won 71.8 per cent; and of the 5,323 involving fewer than 200, unions won 71.4 per cent.[5] Obviously, unions are finding it worth while to organize small firms.

There is an almost universal tendency to underestimate the extent of union organization in the South, in which Fristoe appears to share. The rapid industrial integration of that region with the nation in recent years has been accompanied by a sharp increase in unionization. In the absence of regional statistics, this conclusion must be supported by a variety of sources. The BLS Community Wage Surveys for 1953-1954, for example, revealed the following percentages of plant workers in manufacturing covered by union contract: Dallas, 61; New Orleans, 63; Memphis, 78; and Atlanta, 57.[6] Nationwide corporations with branch plants in the South have almost invariably brought unions with them in such industries as automobiles, steel, rubber, meat packing, and aircraft. More than 90 per cent of some 40 southern pulp and paper mills are unionized, a higher incidence than any other region except the Pacific Coast. Meyers has estimated the extent of unionization in Texas for April 1953 as follows: manufacturing, 45-50 per cent; railroads, 100 per cent; maritime, 100 per cent; telephone and telegraph, virtually 100 per cent; bus transportation, 66 per cent; and interstate trucking, over 80 per cent.[7]

I concur with Fristoe's comment that the labor movement is relatively more vulnerable to depression now than it was in the past because it has organized the more cyclically sensitive industries and has a higher proportion of unskilled and semiskilled workers. It seems to me, however, that the long-term growth of unions could be affected by these considerations only if the business decline were of unusual severity and duration. There is no evidence that the comparatively mild fluctuations of 1948-1949 or 1953-1954 had any such effect. A laid-off unionist customarily stops paying dues but retains his membership; with re-employment he simply resumes payments. In other words, the relationship between a job and membership is loose in this context.

Finally, the differences between Fristoe's views and my own may be more of tone than of substance. On the basis of historic forces presently at work I would expect *gradual* growth in the size of the U.S. labor movement, leaving

[5] Computed from *Eighteenth Annual Report of the National Labor Relations Board, 1953* (Washington, 1954), p. 109.

[6] Bureau of Labor Statistics, *Wages and Related Benefits, Major Labor Markets, 1953-1954*, Bull. No. 1157, Pt. I, pp. 20, 71; Pt. II, p. 33; Pt. III, p. 20.

[7] F. Meyers, "Factors in the Growth of Unionism in an Industrializing Area," unpublished manuscript, pp. 2-3.

aside such eventualities as war or a great depression. Fristoe appears to consider this a real possibility, but is inclined to emphasize the dark spots. I suspect that he is unduly pessimistic.

Davey, Jacobs, and Monroe are to be commended for suggesting the idea of a one-year lag, which, frankly, did not occur to me. As indicated in the original article, however, there is doubt in my mind as to the appropriateness of correlation analysis in this context; the coefficients were published initially only because they agreed with the results reached with several other methods. Hence the reader was advised to give these coefficients "the weight he thinks they deserve."[8]

This caution applies as well to the correlation analysis of Davey and his associates. The secular trend has not been removed from any of the series employed and all five experienced marked growth. Between 1900 and 1948, industrial production, employment, wholesale and retail prices, and union membership expanded in secular fashion. It is certainly not unreasonable to expect that part, and perhaps most, of the explanation for the correlation is to be found in secular rather than cyclical factors. There is, apparently, a tendency for the coefficient of multiple correlation between time series to rise when the number of series increases. In this connection it is worth noting that none of the individual coefficients was significant, and significance at the 5 per cent level was reached only with a multiple correlation. Finally, the fact that several series move together does not necessarily mean that there is a causal connection between them.

The central argument of substance is this: The trade union is a complex institution only partly sensitive to economic forces. These forces, in turn, are only in part cyclical. Hence it makes little sense to construct a theory of union growth about the cycle. It is far more meaningful to assume a multicausal system (including the cycle) at the outset.

I suspect that Davey, Jacobs, and Monroe would find little to take issue with in what has just been said. Again, the differences are mainly of emphasis.

IRVING BERNSTEIN*

[8] "The Growth of American Unions," *Am. Econ. Rev*, June 1954, XLIV, 311, n. 10. At this point I must express gratitude to T. E. Southard of the Institute for Numerical Analysis and to Jesse Proctor of the Institute of Industrial Relations, both of U.C.L.A., for checking the Iowa group's computations.

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Erratum

In the article "The Impact of Labor Disputes upon Coal Consumption," by C. L. Christenson, in the March 1955 number of this *Review*, the second line on page 96 was incorrectly inserted. The first sentence on the page should read, "While railroads with a figure of 132 per cent had duplicated that level in a few single months earlier, they had never before closed a year when reserves had been maintained continuously well above 100 per cent for all twelve months." In the second line of the middle paragraph on the same page, the reference in parentheses should be page 88.

BOOK REVIEWS

Economic Theory; General Economics

The Tools of Social Science. By JOHN MADGE. (New York: Longmans, Green and Co. 1953. Pp. x, 308. $4.75.)

Theory and Method in the Social Sciences. By ARNOLD M. ROSE. (Minneapolis: University of Minnesota Press. 1954. Pp. xii, 351. $5.00.)

On Theory and Verification in Sociology. By HANS L. ZETTERBERG. (New York: The Tressler Press. 1954. Pp. 78. $2.50.)

"If we are honest we have to admit that the first century of social science has left us somewhere short of victory." I do not want to be less honest than Mr. Madge is (p. 290) but I should like to submit that some twenty-four hundred years of known social science have left us where we are, and that we shall always be short of victory because there is no end to the battle for knowledge, social or natural. To Madge social science is only a hundred years young because for him it all began with the establishment of the positivist science of sociology.

The "tools of social science" to which Madge devotes his text are "documents" (37 pages), "observation" (27 pages), "the interview" (110 pages) and "experiment" (36 pages). The last is "the apex of scientific method." The "mental experiment is an invaluable dress-rehearsal but it is no substitute for the real thing." There "can often be an orderly progress through search of documents, through observations, through the various forms of questioning, before we are ready for the rigour of experiment" (p. 292). Has he no place for theory at all? Madge is willing to forgive the "theoretically inclined social scientist" because "the desire to explain and to unify social facts, the search for a consistent framework, these cannot be condemned even by the extreme empiricist, because this desire has motivated much valuable empirical research" (p. 291). But "too many hypotheses are based on ideal and logically tidy considerations . . ." (p. 118). "The only safe source of knowledge about human beings is what we can see and hear, and everything else is guesswork." The techniques described by Madge "have therefore an ostensibly behaviourist foundation" (p. 34).

With all his scientistic preconceptions, his ultra-empiricism, positivism, and behaviorism, Madge is also an adherent of epistemological relativism, of the coexistence of conflicting truths in social science. To him "the only tenable view is Mannheim's perspectivist view of many truths, each shared only by those who have shared experiences and have agreed between themselves on social aims" (p. 5). And "to postulate an objective social science is to ask for something which is probably unattainable, and may even be undesirable" (p. 6).

A clue to one of the sources of Madge's superstitions can be found in the

singular nouns in the title of his first chapter: "The Method of Social Science." If, instead of proclaiming the coexistence of competing truths, he came to recognize the coexistence of different methods and of several social sciences, he would be less myopic also in other matters and less liable to misguide his readers.

For every misunderstanding and misjudgment in Madge's book a pointed criticism and correction can be found in the book by Arnold M. Rose. The very first chapter (a paper which had won the 1952 prize of the American Association for the Advancement of Science for essays in social theory) contains a good statement on the nature of theory and on the testing of deduced hypotheses. But the best antidote to Madge's scientistic methodology can be found in Chapter 14 on "problem orientation versus method orientation." Rose quotes approvingly the psychologist Maslow, who protested against the "over-valuation of quantification for its own sake," against the "creation of a false and pernicious hierarchical system among the sciences," and against the "creation of a scientific orthodoxy, which in turn (a) tends to block the development of new methods, (b) tends to exclude many problems from the jurisdiction of science and (c) tends to make scientists 'safe' rather than daring" (p. 254).

Rose objects to the "primacy of method," according to which "a body of disciplines known as the 'behavioral sciences'—psychology, sociology, and social anthropology, plus a very small section of political science and economics—is distinct from a body of disciplines known as 'documentary sciences' —history, ethnology, political science, law, institutional and labor economics (the rest of economics is put in a class by itself)" (p. 249). In Chapter 15, on "Generalizations in the Social Sciences," there are, besides excellent comments on determinism versus probabilism, some admirable statements on social science as "a pile of discrete bits of knowledge" as against "an integrated body of propositions." "An adequate system of general propositions is based on an internally consistent set of assumptions and definitions, such that each proposition is capable of being logically deduced from the assumptions and definitions (in the manner of a theorem). The building up of an adequate theory—the shorthand term for the framework of assumptions and definitions as well as the propositions deducible from them—requires a constant interplay between theory and data in which the theory is regularly modified and new deductions are derived from it and once more tested by crucial facts" (p. 263).

Two chapters are explicitly addressed to economists: one on "The Potential Contribution of Sociological Theory and Research to Economics," and another on "A Deductive Ideal-Type Method." In the latter, Rose discusses the convertibility between inductive and deductive propositions and presents a good formulation of the distinction: "Inductive studies test the hypothesis that *b* follows *a* under specified conditions. Deductive studies seek to specify the conditions (assumptions) under which *b* must logically and inevitably follow *a*, and they pose for empirical research the question of the relevance of these conditions to any observable phenomena" (p. 340).

I do not know whether the Roses or the Madges are more representative of present-day sociology. But in this war of the Roses against the Magic of

Scientism the third book under review sides with the former. Hans L. Zetterberg's methodological program proclaims "(1) a concern with theories (definitions and hypotheses) rather than frames of reference (only definitions) . . . (2) verificational studies rather than descriptive ones, and (3) a concern with miniature theories rather than an inclusive theory" (p. 13). These "miniature theories," however, should be integrated, not isolated. For, "we explain something by demonstrating that it follows the laws of other phenomena. To ask for an explanation in science is to ask for a theory" (p. 9). Merely "to know the labels of phenomena and to know their distribution is not to explain them" (p. 14).

Zetterberg's observations on operationalism are illuminating. For purposes of verification "only those operational definitions that have a counterpart in a nominal definition are worth while. When verifying a theory, certain measurement devices may very well be worthless [and] irrelevant" (p. 34). The evaluation of the validity of certain operational definitions for a hypothesis formulated in terms of nominal definitions is shown to be one of the most significant steps in the verification of the hypothesis. Zetterberg's book is worth while and relevant for economists.

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The Share of Wages in National Income. By ASHOK MITRA. (The Hague: Centraal Planbureau. 1954. Pp. 113.)

Dr. Mitra's dissertation is a valiant attempt to cope with a problem whose fascination is exceeded only by its difficulty. Despite his ingenuity, his efforts are not altogether successful; however, he is to be congratulated upon the real contribution he has made.

The first chapter is a brief survey of classical, neoclassical, and Marxian distribution theories; the second is a critique of the Cobb-Douglas function as an explanation of labor's share. The criticisms of the latter are generally correct, although a better case could be made for the distributive implications of the "function" than the author's arguments would suggest.

Chapter 3 is a quite sound criticism of Kalecki's theory of income distribution. Mitra perceives clearly that Kalecki's theory is perilously close to a tautology; however, he does not point out that the scant empirical content this theory does possess is almost certainly false. Specifically; if it is assumed that the marginal cost curve in the Kalecki model is parallel to the quantity axis (*i.e.*, is "flat"), all other propositions in the theory can be deduced. And as I have argued elsewhere[1] (contrary to Mitra and others) it is not likely that the *relevant* marginal cost curve—for Kalecki's theory—is flat.

The author is (properly) critical of Kalecki's failure to measure the "degree of monopoly power" directly. Accordingly, in Chapter 4 he attempts to provide such a measure. As Mitra accepts both Kalecki's assumption that the marginal cost curve is flat and Lerner's definition of monopoly power (*i.e.*, *price minus marginal cost price*), his measure of "degree of monopoly

[1] "Rehabilitation of Partial Equilibrium Theory," *American Economic Review*, May 1952, pp. 191-2.

power" varies in the same direction as the ratio of price to average expenditure on wages plus raw materials. To my way of thinking this begs the question between Kalecki and the "marginalists." Furthermore, the statistical methods used are more courageous than delicate. However, despite these caveats, the chapter's finding that (contrary to Kalecki) the degree of monopoly power has not had a cyclical pattern in Britain, is both important and plausible.

In Chapter 5, the author offers an alternative model (for determining labor's share) whose inspiration he credits to Cournot. This model makes the wage share depend upon the following: the ratio of money wage rates to product prices; the rate of depreciation; the quantities of labor and imports (raw material) per unit of output; the number of competing sellers and the "zero demand price" (the intercept of some unspecified aggregative demand curve with the price axis). He then, in Chapter 6, deduces the effect upon the wage share of varying each of the above parameters; the most interesting of the results is that the wage share will *ceteris paribus* vary in the same direction as the share of raw material producers (*i.e.*, import suppliers).

The derivation of this result (pp. 65-66) is suspect because it involves partial differentiation of the wage-share function without consideration of the constraining identity among gross sales, labor income, nonlabor income, imports (raw materials) and depreciation. Nevertheless I believe Mitra to be close to the right answer—even though I would dispute his method of getting there. This chapter concludes with some applications of the model to the interpretation of British data; these are interesting, but not quite convincing.

It is unfortunate that Mitra's ideas must be strained through a very poor English translation. It is to be hoped that stylistic difficulties do not repel students, as the book merits attention.

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Christian Values and Economic Life. By John C. Bennett, Howard R. Bowen, William A. Brown, Jr., and G. Bromley Oxnam. (New York: Harper & Bros. 1954. Pp. xv, 272. $3.50.)

This summary volume in the series on Ethics and Economic Life produced by a study committee of the Federal Council of Churches is a miscellaneous collection made up of four parts, one of which discusses the topic announced in the title of the book. Another part comprises six chapters on international economics by William Adams Brown, Jr., who performs the excellent service of showing the pitfalls awaiting those who would rush thoughtlessly into this field with what might appear to be clear and evident Christian solutions. In addition there is a summary of the findings of the five other books in the series and three introductory chapters comprising an historical sketch by Bishop G. Bromley Oxnam.

The work most pertinent to the topic of Christian Values and Economic Life is that contributed by John C. Bennett, professor of Christian theology and ethics. Bennett advocates a middle way between the extremes of collectivism and individualism. He is for a mixed economy, or the present-day fluid type of capitalism, as the best system for assuring the rights of Christian in-

dividualism in an age of totalitarianism, and as the most promising for achieving the reforms suggested by Christianity.

Bennett is a Christian reformer, not a revolutionist, and a distinctive feature of his reform is that it is to be guided by the scientific analysis of economics and the technical knowledge of those familiar with economic facts. He goes beyond this announced purpose and shows ready acceptance of not only the analysis of economists but also their policy recommendations. Bennett's stand on the issues of progressive taxation, labor relations and social security places him in the political spectrum to the left of the public he is aiming at, the clergy and laity of American Protestant churches. Nevertheless, his writing should gain ready acceptance, for it is a popular presentation in the best sense of that phrase, and a solid contribution to the important work of advancing public understanding of economics and economists.

Bennett may be criticized for neglecting some of the fundamental questions raised by other writers in this field. For example, Is the predominant philosophy of the day compatible with Christian philosophy? Bennett draws heavily upon economists, who reflect the predominant philosophy of their times, and their thought may be, at least in part, antithetical to Christian philosophy. Coleridge, one of the earliest students of the relations between religion and economics, stressed the point that "the articles of our Church, and the true principles of government and social order, will never be effectually and consistently maintained against their antagonists till the champions have themselves ceased to worship the same Baal with their enemies." By Baal he meant the mechanic, Lockeian philosophy that was predominant in his age.

A second question often raised is: Do church and society face a fundamental and novel crisis today? This concern is expressed, for example, by Emmanuel Cardinal Suhard in *Growth Or Decline?* and by Wilhelm Röpke in *The Social Crisis of Our Time*. If we do face such a crisis, economic analysis of itself will not be a reliable device for detecting it or for suggesting all the solutions needed.

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Outline of an Economic Theory. By Benjamin H. J. Eiríksson. (Reykjavík, Iceland: Helgafell Publishing Co. 1954. Pp. 493.)

This book, which is the product of a Harvard doctoral dissertation inspired by the late Professor Schumpeter, attempts to reformulate general equilibrium theory. According to Eiríksson, Walras' system is only capable of treating the value and pricing of services because Walras had an unsatisfactory capital theory. But the serious problems of interest, money and business cycles spring from the valuation of "agents." Contemporary monetary and employment theory merely provide "makeshift solutions" for these problems. The road to a really integrated general economic theory, in Eiríksson's view, is by way of a satisfactory theory of capital and interest which can be blended with the Walrasian system. The major portion of the book is devoted to a new conceptual apparatus for handling the problems of capital, interest, and money.

Eiríksson's capital theory is essentially Austrian, but with a novel twist. In

the Austrian tradition, capital ("durable agents") is a means of "storing" the services of "original agents." The services of capital goods are substitutes for the services of original agents. According to Eiríksson, the essence of capital is this process of storing and substitution. In the orthodox Austrian capital theory, however, there are only two "original agents"—land and labor. But the capitalists nevertheless perform a "function" in production by means of their "saving" or "waiting" which makes the original agents more productive via the well-known roundabout methods of production. The reward for the "capitalists" is the famous "agio," as illustrated by the examples of growing trees and aging wine. It is with respect to this particular "functional" interpretation that Eiríksson departs from his masters.

Instead of two "original agents" (factors of production), Eiríksson introduces a third: money. Money is like the original agents of "land" and "labor" since its value does not depreciate with use. (Nondepreciability is the criterion for classifying an "original agent." One might raise the question, however, whether labor and especially land are in fact nondepreciable.) Money also makes the storing of original services (the creation of capital goods) possible. Money performs a "function" coordinate with traditional "land" and "labor." On this basis, Eiríksson attributes the gain on the accounts of capital agents to money as an original agent. The "agio" theory of interest therefore becomes a "service theory of interest."

With this apparatus, Eiríksson commences his analysis, which is overwhelmingly the application of the equalization principle of asset yields under various assumptions. There is a price level of services (flows) and a price level of agents (stocks). The "general rate of return" appears as a derivative from the respective stock and flow values. The "interest rate" is the rate of return on money as an "original agent." In equilibrium the rates of return on different agents, the "general rate of return" and the "interest rate" are all equal. Difficulties arise (which recall Hayek's business cycle theory) when the "general rate" does not equal the "interest rate" either because the "interest rate" is administered or because the "general rate" may not find its "natural" level due to inflexibility of service or agent prices. Also, problems arise when people "prefer" the "agent" money to other "agents" or services. Indeed, all problems appear as types of "disequilibrium" which result from either inadequate price flexibility, or "institutional rigidities," or an insufficient supply of money.

The attempted scope of this book is so vast that it is difficult to criticize it. One may complain that he does not like the concepts. But one man's concepts may be just as good as another's—it is often a matter of taste. Eiríksson, however, does spend an inordinate amount of time laboring his own notions; and the reader has an enormous job trying to keep straight just how Eiríksson's use of a term differs from someone else's. Moreover, one may not always appreciate Eiríksson's efforts to show how people like Keynes and Wicksell were "wrong" or treated only "special cases" simply because they did not use the same apparatus he does. Yet despite its apparant vastness of scope, there is nowhere in this book a clear statement of the forces that determine "the general rate of return." The best Eiríksson presents on interest rate determination is the proposition that the rate is determined by "preferences" for "agents"

vs. "services." One will look in vain for an evaluation of the relative merits of time preference, productivity, and liquidity preference as determinants of the rate of return. In general, this book is long on concepts and short on fruitful behavior propositions. Everything is explained in terms of "preferences." When positive behavior propositions appear, they are often questionable. For example, we are led to believe that higher rates of return on capital and higher wages always encourage more saving and a larger supply of labor. It is not too safe to base a "general" theory on propositions such as these.

To those who seek a grand theoretical system and who find the Austrian capital theory tradition congenial, this book will prove challenging. For those who share Frank Knight's skepticism of Austrian capital theory (which Eiríksson incidentally ignores) and who also feel that theory should be simple rather than metaphysical, this book will be frustrating. In fairness to Eiríksson, it should be stated that the present reviewer falls into the latter category.

J. A. STOCKFISCH

The University of Wisconsin

The Multiplier Theory. By HUGO HEGELAND. (Lund, Sweden: C.W.K. Gleerup. 1954. Pp. x, 261.)

Dr. Hegeland's book is Volume IX in the Lund Social Science Studies, a series by writers connected with the Institutes for Social Sciences, Lund University. It is published in English and has, we are told in the preface, a primary purpose of presenting "a comprehensive analysis of the methodological problems involved in the multiplier theory and in its application to actual processes of income development." It furnishes us with an excellent review and discussion of much of the literature about multiplier theory and, in addition, traces the earliest notions of multiplicative effects as they were discussed before the publication of the 1931 Kahn article. References are made to the writings of Bagehot (1873), N. A. J. L. Johannsen (1903 and 1913), Fr. Johannsen (1928), and other predecessors of Kahn. However, the bulk of the book is concerned with the Keynesian multiplier and the criticisms, adaptations, and applications of the multiplier principle that resulted from the publication of *The General Theory*: that is, the multiplier of income with respect to investment, derived from a consumption function in which consumption is a function of income.

The chapters on lags and leakages provide a generally adequate survey of these discussions and at the same time make clear the differences between the two. There is a useful section on the relation, or lack of relation, between the multiplier and the income velocity of money. Also, brief sections furnish a discussion of the spatial and matrix multiplier concepts and of the possible uses which may be made of these tools.

Unfortunately, the avowed aim of the book seems to lead Hegeland astray. It is his view that the methodological problem in multiplier theory is that the theory is based on faulty assumptions. In his conclusion, he notes that the logical truth of the multiplier theory is self-evident; he does not wish to appear to deny the formal validity of the theory. It is the application of the theory to policy problems that is his concern, and it is here that he feels that we must

question the assumptions. Since it is the empirical truth rather than the logical truth of the proposition that is in question, one would expect that more effort would be devoted to examining the applications of the theory. At one point, Hegeland recognizes the need for such investigation but states that it is beyond the scope of his book. There is, therefore, only a brief section in the concluding chapter in which the results of the application of the multiplier theory in Germany, the United States and Sweden are discussed. The conclusion reached is that only one clear case could be found in which multiplicative effects on income resulted from a period of deficit spending. There is an overabundance of assertions to the effect that confusion exists in the theory between mechanical and real relationships. Part of this problem, he states, arises because of the absence of expectational influences in the original assumptions.

In a footnote comment, Hegeland further asserts that "all multipliers are mere definitions" (p. 158, n. 1). Since he has previously shown that the multiplier theory under discussion is derived from a consumption function which is a behavior relation, it is difficult to reconcile these two points of view. No further explanation of this statement is made except for a reference to Somers who considered the instantaneous multiplier to be a definition. If it were true that all multipliers were simply definitions, there would be no point in discussing either the logic of the theory or the nature of the assumptions. There appears to be little question that the multiplier theory can be stated in the form of a verifiable proposition. In fact, Hegeland has done this.

There are excellent discussions of the political problems concerned with the question of deficit spending and of the statistical and empirical problems involved in concepts such as a marginal propensity to consume for the society as a whole. Had there been more attention centered on the problem of empirical verification and less on the question of the validity of the assumptions, this book would have been a more valuable contribution than it is. It can be recommended highly for its survey, discussion, and synthesis of a large segment of the literature in this area.

Allan H. Meltzer

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Wirtschaftliche Entwicklung und soziale Ordnung. Edited by E. Lagler and J. Messner. (Wien: Verlag Herold. 1952. Pp. 456. $6.00.)

In this work more than thirty economists and social scientists, almost all from Germany and Austria, have joined hands to honor the late Ferdinand Degenfeld-Schonburg of the University of Vienna on the occasion of his seventieth birthday. Most of the articles are written in German, only a few in English and French. The editors were not well advised in choosing a title which is too vague to convey a definite meaning and yet too narrow to do justice to the content of the volume.

Because there is no common denominator among the articles, this review will be confined to a survey of some areas of concentration. There is, for instance, a group of important articles on recent trends in economic and social policies. Most of these are of a highly general character, dealing with such topics as

centralization and decentralization in economic policies (Wilhelm Röpke), problems of the world economy (Adolph Weber), international monetary policies (Joseph Dobretsberger), and social policies (Otto v. Zwiedineck-Südenhorst). Heinrich Niehaus tries to assess the prospects of an agrarian union in Europe. Alfred Müller-Armack, chief adviser to the German Minister of Economics, Ludwig Erhard, interprets the character of the "social market economy," credited with the surprising resurgence of Western Germany after the currency reform of 1948. Somewhat unrelated to this group and the rest of the symposium is a series of essays dealing with the interrelations of law, economics and social organization (Ludwig Adamovich, Alfred Verdross, Hans Schima, and Hans Schmitz).

The overwhelming majority of the other contributions remains within the conventional precincts of economic theory. There are, of course, some departures into the history of economic thought, as in an essay on natural law and economic liberalism (Goetz Briefs, Washington) and a sketch of the earlier stages of economic reasoning (Bernard Pfister). The variety of the other papers is striking. They deal, for instance, with currency depreciation and the terms of trade (Gottfried Haberler, Harvard University), psychological roots of economic dynamics and their significance for value theory (François Perroux, Paris), types of market organization (Alexander Mahr), collective wants (Wilhelm Weber), the public sector of the economy (Anton Tautscher), taxation and socialism (Richard Kerschagl), and welfare economics (Johannes Messner).

While, in the compass of this review, it would be presumptuous to try to convey an impression of the wealth of ideas contained in these papers, an exception should be made on behalf of a defiant article on Keynes, contributed by Hans Mayer of the University of Vienna, generally regarded as the present head of the Austrian School. Both smaller and larger weapons are used in Mayer's frontal attack. Let us first mention his objection to the definition of the labor unit by which, according to Keynes, employment is to be measured. The conversion of an hour of special labor into hours of ordinary labor appears to Mayer not only as a naïve oversimplification, but also as a resurrection of a long-since disproved part of the Marxian labor value theory. In the same context he questions the reality of the alleged concentration of the workers on nominal wages. Although Keynes did not take pains to support his argument by empirical data, Mayer refers to the interest of labor unions in adjusting their wages to index numbers as indicating the opposite attitude. Keynes' basic contention that underemployment may be coincidental with a stage of equilibrium is rejected as too general. It could never happen if wages were flexible. The "fundamental psychological law"—Mayer believes—was neither fundamental nor even a general psychological law. Its validity depended upon the level of incomes and the structure of income distribution. The incomes should considerably exceed the minimum of existence. Of another related element of the Keynesian model, Mayer suggests that it was inconsistent with an essential principle of the *General Theory*. How could the consumption function be assumed to be stable in the short run if, in general, all economic quantities varied with a change in income? Consequently the consumption function should

not be regarded as a pillar of the Keynesian system. It was only the "illusion of a pillar" (p. 48). With the same firmness other Keynesian positions are challenged, for instance, the concentration on full employment instead of on the maximization of satisfaction, the scant attention given to dynamic factors, the predilection for monetary analysis, and, of course, the predominance of the aggregative approach.

In Mayer's view those deficiencies loom too large to be offset by some valuable clarifications of more special problems, particularly in the fields of money and credit. Nor should Keynes be praised as the originator of revolutionary notions. The *General Theory* was not a system; it was not even a theory in the customary sense. Thus Mayer cheerfully subscribes to Leontief's cynical remark that Keynes "seemed to press . . . for reconstruction of the whole foundation in order to mend a leaky roof."

FRITZ KARL MANN

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Value, Capital and Rent By K. WICKSELL. Translated by S. H. FROWEIN. (New York: Rinehart. London: G. Allen and Unwin Ltd. 1954. Pp. 180. $3.50.)

The recent appearance of this translation of Wicksell's first book, *Über Wert, Kapital und Rente* (Jena, 1893), is both timely and long overdue. Its timeliness arises from the fact that it contains a penetrating evaluation of Leon Walras' *Elements of Pure Economics*,[1] which also first became available in English a short time ago in Jaffé's remarkable translation. The early exhaustion of the reprinted German edition of Wicksell's work shortly after it was issued in 1933 by the London School of Economics is, however, clear proof that there has been an unfilled demand for the present translation for many years.

To scholars and specialists, *Value, Capital and Rent* is of interest chiefly from the standpoint of history of economic thought and more particularly because of the contribution Wicksell made to the marginal productivity theory of distribution. For one thing, his treatment of the role of time in the theories of value and of distribution was original and unique for its period. Further, it is notable that in this work he was the first theoretician to achieve a synthesis between the Walrasian and the Austrian types of economic analysis.

For contemporary students this treatise is likely to be of considerable pedagogical value as an introduction to comparative static equilibrium analysis. It should prove especially instructive to the theoretically inclined, for here they are given more than just a glimpse, at the level of the elementary calculus,

[1] Wicksell's early criticism of Walras, particularly of his concept of capital as propounded in the second edition of *Elements of Pure Economics*, is expressed in *Value, Capital and Rent*, pp. 18-21, pp 92 ff, and pp. 164 ff. In his later writings Wicksell modified his position on the Walrasian theory of interest and capital. On this point see particularly pages 236-38 and pages 225-27 in his article "Professor Cassel's System of Economics," which is appended to the English translation of Wicksell's *Lectures on Political Economy*, Vol. I (New York, 1934). For comments on some of Wicksell's criticisms of Walras, see Jaffé's "Translator's Notes" in Leon Walras, *Elements of Pure Economics* (Homewood, Ill., 1954), pp. 510 ff.

of how effectively mathematics can be applied in economic analysis. As a painless introduction to "mathematical economics," this work has, so far as this reviewer is aware, no equal in the English language, with the possible exception of E. H. Phelps Brown's *The Framework of the Pricing System.* The latter, however, deals with equilibrium analysis in a less complete manner than does Wicksell and further, Phelps Brown reduces, not always without difficulty, all demonstrations to arithmetic.

This translation by Frowein is, on the whole, excellent and true both to the spirit and the letter of the original. However, it is unfortunate that he interpreted the word *Rente* in the title as "Rent" instead of as "Interest." The German word *Rente* has no direct equivalent in English usage, except possibly something as clumsy as "property income." On the other hand, our term "rent" is too closely associated with the Ricardian concept of differential land rent to serve happily in the title of a work which devotes far less attention to the theory of rent than it does to the theory of interest. For the foregoing reasons this reviewer believes a more representative title for the translation would have been *Value, Capital and Interest.*

Shackle's "Foreword" to the English version of this work attempts to establish a direct link between the interest theory expressed in *Value, Capital and Rent* and the cumulative process analysis of Wicksell's later monetary writings, as well as a direct connection between the latter and the monetary analyses of Keynes and of Hayek, which are treated as complementary to one another. This probably stretches one or more points too far. At least in so far as Wicksell was concerned, his theory of capital and interest underwent several changes over the years. The link between the interest theory of the present work and the analysis of variations in the natural rate versus the market rate of interest in *Interest and Prices* (New York, 1936) and in his *Lectures on Political Economy,* Vol. II (New York, 1935) is, to say the least, not very direct. This is due to the fact that he gradually abandoned the period of production concept of capital featured here for other and more fruitful conceptions.[2] As it is, Shackle's essay would probably be a more appropriate foreword for Wicksell's *Interest and Prices,* for which it was not intended, than it is for *Value, Capital and Rent.*

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Economic History: National Economies; Economic Development

From Mine to Market: The History of Coal Transportation on the Norfolk and Western Railway. By JOSEPH T. LAMBIE. (New York: New York University Press. 1954. Pp. xviii, 380. $6.00.)

This interesting volume, the third in the Business History Series of New York University, is a very creditable job. In fifteen well-written chapters Professor Lambie has traced the development of one of the important

[2] Concerning the transformation of Wicksell's capital analysis, see, for instance, the present writer's article, "Knut Wicksell—A Centennial Evaluation," *Am. Econ. Rev.*, Dec. 1951, XLI, 844-48, 850-52, 856-57.

Pocahontas railroads from its origins in the mid-nineteenth century to the present. The major emphasis is on the important events of the late nineteenth and twentieth centuries. This is, however, no noneconomic chronicle of the glamour and achievements of railroading, nor is it a glorification of the company and its management. Rather economists will here find a sober and critical discussion of the economics of railway policy.

Lambie devotes major attention to those matters which are of major concern to transportation economists, such as rate structures, pooling, the relations between coal operators and carriers, rate warfare, the problem of the allocation of the car supply among mines, differentials in the rates from the coal fields to the various ports, and the maneuvers of the major coal carriers, the Norfolk & Western, the Chesapeake & Ohio, the Virginian, and the Pennsylvania to secure profitable coal traffic. He has shown a sure grasp of the major factors in the economic survival of the railroad.

The author has made extensive use of the archives of the railway, but he has carefully balanced this material with that from the many Interstate Commerce Commission cases on the coal trade and the coal rate adjustments as well as other sources on the tidewater coal business generally. The result is a balanced and useful discussion of the rise of this important branch of American traffic. Economic historians will also find that the author has filled a number of gaps in the economic history of the East, while the new breed of specialist, the business historian, will find much of interest with respect to business organization and policy.

JOHN G. B. HUTCHINS

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Soviet National Income and Product, 1940-1948. By ABRAM BERGSON and HANS HEYMANN, JR. A Research Study by the Rand Corporation. (New York: Columbia University Press. 1954. Pp. xii, 249. $5.00.)

Soviet National Income and Product in 1928. By OLEG HOEFFDING. A Research Study by the Rand Corporation. (New York: Columbia University Press. 1954. Pp. 156. $3.75.)

These two books follow the methodology established by Bergson in *Soviet National Income and Product in 1937* (Columbia University Press, 1953). Altogether Bergson and his associates have now presented comparable cross-sectional national income accounts for the Soviet Union for five important years: the eve of the Plan Era; 1937, the terminal year of the second five-year plan and a turning point in many respects; the last full prewar year, colored by intense military preparations; 1944, the peak of the war years; and 1948, a year witnessing considerable progress in reconstruction and in the "normalization" of economic life after the war. Thus the trilogy is of the greatest significance for our understanding of the structure of the Soviet economy at various crucial points in its development, and of changes therein over time. The authors have not (as yet) deflated their results for the intervening price movements.

The essence of Bergson's methodology is the conversion of actual ruble values, in themselves of doubtful analytical meaningfulness, to "adjusted

ruble" values in conformance with a theoretical "Adjusted Factor Cost Standard" (AFCS), so as to permit the measurement of national product and its components in terms of "real" resource cost. The authors display much insight, statistical skill, and theoretical acumen to this end. But the inadequacies of the underlying data force them to restrict factor costs almost entirely to the return to labor services and the accounting profits of enterprises (chiefly state-owned), and largely to omit interest and economic rent. Moreover, the rationale of treating the accounting profits as a "real" factor cost is—as the authors agree—a debatable one. In a side calculation, Bergson and Heymann attempt to appraise the probable effects of these deviations from the AFCS on the shares of defense and investment in total outlay, 1937-1948 (pp. 75 ff.). The resulting corrections are at times appreciable, though not major.

Even such a large and "simple" factor return as the earnings of hired labor falls short of the requirements of the AFCS upon closer scrutiny. The chief theoretical difficulty here, as Bergson and Heymann point out, is the intrusion of stringent manpower controls since 1940, throwing doubt on the correspondence between wage and salary differentials and differences in "real" costs. Obviously, the authors can do no more than explain the difficulty and try to live with it.

The trilogy bears eloquent witness to the drying up of quantitative information on the Soviet economy over the twenty-year span embraced by it. Hoeffding still has the benefit of voluminous and high-quality statistics for the late 'twenties, and at times is even embarrassed by the riches of his sources. This ample fountain becomes a trickle by 1937 and 1940, and all but gives out for 1944 and 1948. To compile their accounts for the last two years, Bergson and Heymann can rely on only scattered and very fragmentary data, and thus have to resort continually to inter- and extrapolation, indirect evidence, bold estimation, and outright "educated guessing." The result for these years at least in part depends on their *Gestalt*-like perception of the Soviet economy, and to this extent will undoubtedly diverge in detail, if not always in major outline, from the images obtained by other students in the field. But considering that they take pains to spell out their guesses and assumptions, the present reviewer finds in this not so much a cause for criticism as an occasion for commending the authors' courage.

The conceptual and statistical handicaps are compounded perhaps most seriously in the valuation of consumption in kind, chiefly food consumed within the same peasant household or the same collective farm. This the authors express at current average realized farm prices, except for 1944, when they use 1940 average prices. Perhaps indicative of the inherent difficulty of the problem is that Bergson's 1937 study has already been criticized for attributing both too high and too low a value to this component. In this regard one must be careful to eschew criteria that are extraneous to his approach. The AFCS aims only at making ruble values express "real" costs; hence, factors of comparable productivity ought to receive approximately the same valuation. The AFCS does *not* attempt to express by means of ruble values the relative standards of living of owners of the factors, as some of Bergson's critics seem to have implicitly assumed. Nevertheless, valuation of food consumption

in kind at average realized farm prices may not be the procedure most consistent with the AFCS, and, as this reviewer has suggested elsewhere, may have led Bergson to understate the contribution of peasant producers in 1937 (and hence also the relative shares of agriculture and of consumption in the respective totals), if the earning rate of comparable *wage* labor is taken as a yardstick. On the other hand, this understatement (if any) may be much smaller for 1948, not because peasants fared better relative to urban workers in that year than in 1937—they fared much worse—but because agricultural *wage* labor also seems to have earned relatively very poorly in postwar years, judging by some scattered indications in Soviet literature. It should be noted that the authors are very much concerned with the valuation of returns to peasant labor, and both Bergson-Heymann (pp. 58 ff. and 78) and Hoeffding (pp. 63 ff.) offer interesting alternative computations.

The statistical results of these studies will undoubtedly provide food for thought to economists and other social scientists for many years to come. Consider the finding that the rate of gross investment out of gross national product (in terms of "adjusted rubles") was already as high (23 per cent) on the eve of the first five-year plan as in 1937, and almost as high as in 1948. (If some of the alternative computations are accepted, more of an upward trend is indicated.) But the consumption of households fell, from 66 per cent in 1928, to 56 per cent in 1937, and to 45 per cent in 1948. The decline in the share of consumption was almost entirely absorbed by rising shares of defense, security forces, and communal services. At this juncture the reader is welcome to speculate about the impact of political events—past, present, and prospective—on the course of Soviet economic development.

Another interesting finding is that even at the very height of the second world war, and at a time of extreme consumer privation, the Soviet Union was able and willing to maintain a rate of gross investment of 13.5 per cent. True, some of it was undoubtedly urgent reconstruction in the liberated areas, and some was greatly expedited by lend-lease and other allied help. Moreover, the figure may contain an upward bias in that much of this construction was undertaken with lavish resort to monetary incentives. Still, the fact bears attention. The trilogy thus abounds in significant and challenging statistical results. The authors offer only a modicum of interpretation of their findings; the rest is up to the reader, and, one hopes, to the authors' own pens in the future. Even so, there is no doubt that the work ranks among the most important contributions to western inquiry into the Soviet economy.

GREGORY GROSSMAN

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The Prospects for Communist China. By W. W. ROSTOW in collaboration with RICHARD W. HATCH, FRANK A. KIERMAN, JR., and ALEXANDER ECKSTEIN. (Published jointly by the Technology Press, Boston, and John Wiley & Sons, New York. 1954. Pp. xx, 379. $5.00).

This is an interpretative essay on the prospects of success or failure of the Communist regime in the China mainland. The book is divided into six parts, dealing successively with (1) the struggle for power up to 1949, (2) the evolu-

tion of Communist policy, (3) the regime and the people in the light of Chinese history and in terms of their current aspirations and reactions, (4) Sino-Soviet relations, (5) the Chinese economy, and (6) the prospects of the regime. Parts 3 and 5 are chiefly the products of the associates, and Rostow is responsible not only for the other four parts but also for the formulation of a unified view in interpretation. While interpretation is by nature subject to controversy, I find that his judgment on the whole is remarkably balanced and sound. Rostow need not feel apologetic about "this intrusion by an outsider into the field of China studies" (p. viii), for the book is as significant to students of Communist China as to those interested in the economic development of underdeveloped countries.

The underlying theme of the book is that the Communist regime is primarily concerned with maximization of its political and military power in China, within the Communist bloc, and vis-à-vis the external world. The economic development program, with its emphasis on heavy industry and transport at the expense of agriculture and consumers' welfare, is calculated to be a vital measure to attain this objective; and it is upon the outcome of this program that the prospects of the regime will largely depend. Evaluation of the program appears as Part 5 in the book and is chiefly the work of Alexander Eckstein. The first three years of the Communist regime (1950-52) were a period of general economic recovery, price stabilization, and institutional reorganization, thus preparing the ground for sustained industrialization under the first five-year plan to start in 1953. In view of the Communist propaganda on the rapidity of recovery to the prewar peak during this period, it is interesting to find in the analysis that excepting 1949, a year of acute drought, Chinese agriculture had recovered steadily since 1945 and the regaining of the 1936 level by 1952 was a continuation of the same trend. According to the absolute figures on production given by Chou En Lai of the regime in September 1954, which came too late for the author to use, it is also clear that industrial production in 1949 was not as low as he estimated (p. 239)—*e.g.*, there was a 20 per cent underestimate of coal and electric power production. The institutional reorganization is well presented, though reference should have been made to the important Communist technique whereby private enterprises have been reduced to relying almost entirely upon the orders of state enterprises. It has been officially reported that 86.4 per cent of the production of all the large private firms in eight biggest cities was for state enterprises by the first quarter of 1953.

The target of the plan, if Chou's figures for 1954 are to be trusted (and they seem reasonable), is to bring the industrial sector close to the Soviet 1932 level. This, if attained, would be a significant achievement. The study finds that "this rate of growth would not seem to lie beyond the resource capacities of the Chinese Communist Economy" (p. 277). This conclusion is reached with a number of assumptions, the most important of which are (1) that 12 per cent of the gross national product (a rate estimated for 1952)—and a progressively higher rate as time goes on—is for gross domestic investment in the modern sector, this not including nonmonetary investment in the rural sector, (2) that 20 per cent of the industrial capital formation is derived from

exports mainly of agricultural and mineral products, and (3) that a minimum increase of 13 per cent in agricultural output from 1952 to 1957 is necessary to meet the export requirements and the consumers' demand of a growing population and urbanization, provided (4) there is Soviet economic assistance amounting to $100 million for the whole period. Shortly after the study was made, there came an official announcement of $130 million of Soviet economic aid. The key to the success of the plan is then held in agriculture. According to official reports, there was an annual increase of 3 per cent in food grains for 1953 and 1954; nevertheless the value of agricultural production (presumably at 1952 prices) had risen only 1.5 per cent for 1953 when the cultivated area damaged by floods and drought was but one-half as large as the area damaged in 1954. This perhaps explains the sudden rate of agricultural collectivization last year, for which the regime was unexpectedly called upon by these circumstances to realize: the number of producers' cooperatives organized by the end of the year was eleven times the target set for the twelve months at the beginning of the year, now covering about one-tenth of the total number of rural households. Whether agricultural production will be increased by this device remains to be seen. There is at least strong supporting evidence that "the success of Peking's First Five Year Plan is not assured" (p. 218).

On very much the same assumptions the author proceeds to construct an interesting model of Chinese self-sustained economic development from 1952 to 1962. It is found that over the decade the gross national product would be increased by some 37 per cent and per capita income by 8 per cent. However, the statistical information released by the regime in the last quarter of 1954 calls for a radical revision of these estimates.

CHOH-MING LI

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The Economic Development of Japan. By WILLIAM W. LOCKWOOD. (Princeton: Princeton University Press. 1954. Pp. ix, 603. $10.00.)

Professor Lockwood's monumental study covers the growth and structural change in Japan's economy from 1868 to 1938. His purposes originally were twofold: (1) "to show the importance to Japan of the international order which her militarists had done so much to destroy, and which would have to be recreated in its essentials if she were again to prosper," and (2) to challenge a prevalent notion "that Japan's economic development since the Meiji Restoration had been confined mainly within the sphere of foreign trade and factory industry, that its benefits had been largely drained away in imperialist wars and zaibatsu profits." As his researches progressed over a decade, however, his task broadened into a study of the whole process of Japan's economic growth from 1868 to 1938.

As a case study in economic development this volume will interest many economists, even though they have no particular concern with Japanese problems. It is the record of one of the most remarkable transformations in economic history. Within the space of three generations Japan emerged from national poverty and seclusion to become one of the leading industrial powers. How was it done? What were the key elements in the transformation? What

are the lessons for nations still on the threshold of economic development?

Primary production (food and raw materials) in Japan increased fourfold between 1873 and 1911. This growth clearly outran the 40 per cent increase in population over the same period. It provided a major share of the savings and tax revenues which financed the industrial and military expansion of the period. Nor did growth cease after 1914. From 1910-14 to 1930-34, there was a 45 per cent increase in food production and a 75 per cent gain in output of raw materials. This compares with a 34 per cent rise in population over the same period. More spectacular was the rise in manufacturing activity. In the quarter-century from 1905-9 to 1930-34, there was a fourfold advance. From the turn of the century, for four decades, manufacturing advanced at an average annual rate of almost 7.5 per cent. Greatest relative gains came during the first world war and at the time of the world depression, in 1931-35.

The best criterion of expansion, however, is the over-all growth in net national product. Based on a comprehensive inquiry by Yuzo Yamada of Hitotsubashi University (*Nihon Kokumin Shotoku Suikei Shiryō*, Tokyo, 1951) Lockwood concludes that the aggregate increase was fourfold from 1885 to 1935. This is an annual rate of nearly 3.3 per cent. According to Yamada's figures real income produced within the country nearly doubled in the quarter-century before 1910. It then doubled again during the first world war and the postwar decade. In the boom of the 'thirties the index rose another 50 per cent. The population of the country rose from 39 million in 1885 to 69 million in 1935. Yamada's figures therefore imply a per capita increase of 150-200 per cent in net output.

Although only part of the aggregate growth in income produced was actually available for raising living standards, the rise in consumption levels was substantial. For example, real wages rose 33 per cent between 1897 and 1914 and 65 per cent over the next quarter of a century. The average industrial worker in Japan was able to buy at least twice as much with his daily earnings in 1937 as he could in 1897.

How did all this come about? Lockwood takes pains to minimize the role of the state. ". . . a study of the whole process of economic growth in modern Japan leads to the conviction that the real drive and momentum lay in large measure outside the realm of national political ambition and State activity. At most the latter only accelerated a process of industrialization which was latent in the whole conjuncture of forces at work." It was, in Lockwood's view, the unleashing of individual ambition and private enterprise at a very favorable point in history (world trade expanding, prices rising, etc.) that brought about Japan's growth.

He doubts that the process can be repeated again in other Asian countries. "Many of the peoples of Asia are developing a set of social expectations and immediate demands such that they will probably be unwilling to tolerate the great inequalities of private property and income so patiently borne by the Japanese." Furthermore he sees little evidence that the well-to-do class elsewhere in Asia "is disposed so largely as it was in prewar Japan to save and invest." He warns that the lesson of Japan indicates that unless population growth can be held in check, the mere increase in numbers will absorb much of

the gains of development, and "unless political institutions can be created to harness productive power to welfare goals, still more of the gain may be dissipated in war and conquest."

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Britain and the U.S.A. in the Caribbean: A Comparative Study in Methods of Development. By MARY PROUDFOOT. (New York: Praeger, 1954. Pp. xxi, 434. $8.50.)

Comparing the methods employed and the results achieved by Britain and the United States in one area where both have had a certain responsibility for nonself-governing people seems at first an intriguing idea. Perhaps by setting one policy off against the other the strengths or weaknesses of both might appear. It was with this possibility in mind that Mrs. Proudfoot set out on her research. Some six years later she comes to the publication of her findings not at all sure that anything of significance has turned up. The effort has some of the irrelevance of comparing apples and horses.

The British are an old and responsible colonial power, organized to carry the obligations of supervisorship. The United States has wanted to pretend not to possess colonies even though temporarily it might have substantial population and areas attached to itself. The British methods are only suitable to a highly professional bureaucracy with a permanent policy and a fixed governmental setting. They could not possibly be transferred to the United States which is without a professional service, has only a rudimentary governmental office to set over against the mighty Colonial Office in London, and has legislators who only infrequently show a sense of responsibility toward subject peoples—especially when the interests of their constituents are affected.

But academic researchers do not give up easily. Mrs. Proudfoot's is one of the series of Colonial and Comparative Studies so ably edited by Marjorie Perham of Nuffield College, Oxford. And she makes the unlikely comparison yield some worth-while results. These are not so much methods which either nation could borrow wholesale from the other as they are materials for self-examination. In the vast undertaking represented by the transformation of a colonial empire into a commonwealth, Britain cannot afford to overlook any experiment or suggestion. And Americans are reminded, if they do not already know, about a chapter of incredible irresponsibilities which may possibly have lessons for the future. Perhaps, after all, the seemingly incongruous developments may yield some returns of a practical sort.

One thing is certain. The United States will never again willingly undertake to administer a conquered people. And the reasons why this is so, and ought to be so, are amply set forth here in many careful pages. These recite the deficiencies of administration, the whimsicality of policy, and the bursts of expensive generosity which have marked the Puerto Rican and Virgin Islands enterprises. And it is made clear that these go back to the nature of our institutions. Informed students have known all this, of course, for a long time. There have been numerous studies, particularly of Puerto Rico, which could lead to no other conclusion. It may even be that self-examination on the part

of Congressmen may have played a considerable part in the decision to establish the *Estado Libre Associado* or Commonwealth, which has now existed for six years. It can be taken as a confession of inherent disability. For American students Mrs. Proudfoot's study covers familiar ground.

British students very likely have no more to learn. The researches of the past decade have been numerous and competent. But it is worth while to reinforce them with a pointed reminder concerning mistakes which, in spite of a great bureaucracy, a responsible attitude, and well-known facts, have been profound.

The truth of the matter is—though what lesson there is in it, I should hesitate to conclude—that the two creative and reconstructive ideas which have proved to be valuable have come from the Americans and not from the British. These have been the Estado Libre Associado and the development program, both exemplified in the Puerto Rico of the last decade, the one political, the other economic, and each complementing the other.

The British are persisting in fostering a dominion in the West Indies after the pattern of the others so successfully developed elsewhere. But Jamaica and Trinidad, the two considerable colonies—both in population and resources—are separated by 1200 miles of open sea. Stretching in a north-bending arc, Barbados, the Windwards, the Leewards, and the British Virgins have, among them, so scarce a population, and so little commerce with one another, as to ensure a serious divisiveness. It would surely have been more sensible to have followed the Puerto Rican pattern and set up several associated states. Now it is too late.

The British have had a development program since before the war. It resulted from the recommendations of the Moyne Commission of 1938. From the first, however, it concentrated on welfare rather than productive development. The result was a series of fine educational, health and allied institutions beyond the means of the local governments to support, although the policy was not to outrun local resources. In Puerto Rico a sharply contrasting concentration on productive facilities has set in motion an upward spiral so decisive that the island has become a kind of pilot plant for induced economic development among all underdeveloped peoples.

Mrs. Proudfoot could hardly be expected to draw so sharp a conclusion which perhaps I may exaggerate. As a result, however, of not doing it, she is inhibited in accounting for the rapid rise of well-being in Puerto Rico and the relative slowness of development in the British colonies.

I should not expect her to agree that dominion is an impracticable objective for the West Indies. It is by now an accepted British policy, however reluctantly the more prosperous islands approach union with the less prosperous ones. It must be said, however, that there are hints concerning the value of the Puerto Rican example. There is an unacknowledged resemblance to it in the Jamaican development scheme and, so far as they could, others seem also to have followed. But the inherent difficulties make the same approach inexpedient.

It seems to me important to say that one item of American methodology of utmost significance is not fully uncovered by Mrs. Proudfoot, careful as

her surveys have been. The Puerto Rican success is very largely owed, in my opinion, to the intimate connections between various government departments and the corresponding insular departments which have been possible without centralized intervention. Life-giving technology and grants-in-aid from the federal complex flow through Puerto Rico just as though she was one of the sisterhood of states. This is true in agriculture, health, education, public roads, hospitals—all the various state-aid programs. There is no colonial office through which assistance must be routed—and, it might be said, no State Department either. The one has prevented development in the British dependencies; the other has gone a long way to nullify efforts to assist Central and South American countries.

If there is a "secret" in this matter of induced development I feel certain this is it. But, of course, it is not available for British emulation.

Mrs. Proudfoot's book is in sequence rather with Paul Blanshard's *Democracy and Empire in the Caribbean* (New York, 1946) than with such more specialized studies as H. S. Perloff's *Puerto Rico's Economic Future* (Chicago, 1952) and others of a similar sort. The comparative effort may not be very rewarding, but the information is reliable and the observations on the whole are well considered.

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Economic Problems of Underdeveloped Countries in Asia. Edited by B. K. MADAN. (Bombay: Oxford University Press. 1953. Pp. iv, 290. $3.30.)

This volume presents a sample of professional Asian opinion regarding development policy. Most of the contributors are economists, twelve from South and South East Asia, one from the Middle East, and three Westerners now living and working in the East. Their papers are grouped in three sections, which might be titled: the role of foreign capital and technical assistance (6 chapters); surveys of economic development in particular Asian countries (9 chapters); and proposals for an international development authority (1 chapter).

The purposes of the Indian Council of World Affairs in publishing these articles (which first appeared in *India Quarterly*) were "bringing the facts up to date" and "offering detailed and constructive suggestions on the subject." Since the material upon which the volume is based is now three years old, those chapters which concentrate on the first objective miss their mark. They demonstrate, instead, that attempts to give capsule descriptions of entire national development programs make dry and insignificant reading. Fortunately, however, those authors who have ventured policy suggestions have not confined themselves to "detailed . . . suggestions," but have dealt with some of the larger issues faced in common by most of the underdeveloped countries.

B. K. Madan (India) poses the problem of financing basic development projects which have negligible or low yields with foreign grants or cheap loans. Most of this aid must come from a single country, the United States, which leads to bilateral agreements. However, Madan wants an international agency as intermediary. V.K.R.V. Rao (India) reviews the development of thought in

the United Nations and program proposals to deal with this problem—including his own suggestion for an International Development Authority. Acceptance has grown for the idea (and practice) of intergovernmental capital grants as a supplement to interest-bearing governmental, private, and International Bank loans. But Rao's desire for complete separation of grants from actual or implied political commitments by establishing an international granting agency has gone unfulfilled. Nevertheless, Rao's views make good reading alongside current discussions of United States foreign aid.

Several contributors consider the role of private capital in development. Maurice Zinken (Lever Brothers—India) argues that the developing country must embrace private saving as a virtue, acclaim the entrepreneur, and encourage its citizens to strive for material gain—types of behavior which are notably lacking. D. R. Gadgil (India) believes that too much reliance on private capital formation is exactly what is wrong with India's present approach to development. India's official planners might not agree with Gadgil that they have given top priority to public expenditures on agriculture and transport in order to avoid interference with private business in the industrial sector (pp. 83-84). Other reasons can be given. Nevertheless, Gadgil argues forcefully that the Indian government should use stronger measures to increase the flow of savings into its own hands and employ these resources primarily for the development of basic industry.

There is nothing new in the issues or arguments, but for those who would like to know where some influential Asians stand, the book is worth examining.

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West African Trade—A Study of Competition, Oligopoly, and Monopoly in a Changing Economy. By P. T. BAUER. (New York: Cambridge University Press. 1954. Pp. xvi, 450. $10.00.)

Mr. Bauer's work represents six years of research and writing sponsored by the Colonial Office and financed by Colonial Development and Welfare funds. It is unquestionably an able and comprehensive study of the external trade of the Gold Coast and Nigeria. To this reviewer, its value is unfortunately seriously qualified by the author's polemics against practically all interventionist policy and implicitly against the very notion of development planning.

Separate sections describe and analyze the import and export trades, their monopolistic elements, marketing reform policies, and the important development of statutory marketing of principal export crops. Apparently the original project was to focus upon the activities of the few large firms which have dominated the commerce of West Africa and particularly upon the huge Lever Brothers combine, United Africa Co. Bauer clearly shows the basic oligopolistic and often restrictionist character of the markets, but the greater part of the book, notwithstanding its official sponsorship, is an attack upon *government* policies.

The work focuses principally upon two matters: the role of administrative restriction in perpetuating concentrated markets, and the role of the statutory marketing boards in their alleged effects upon economic development. West

African commerce tends naturally to monopoly because of the special capital and experience requirements. But government policy has served rather to reinforce this tendency and to inhibit potential competition. In Bauer's eyes, true protection for Africans lies only in the promotion of more competition and the reversal of interventionist policy designed to protect African producers, traders, and consumers. The complex of trade, exchange, and price controls; restrictions upon immigration and European land purchase, and statutory marketing serve only to deter possible new entry and investment.

Bauer apparently fails to appreciate that policy objectives other than the vigorous promotion of European commerce must be considered. The history of such areas fails to show how the economic development and welfare of *Africans* can be expected under such a policy. It is more likely that it would serve to perpetuate the typical colonial patterns of monoculture, economic dependency, and low productivity. It would certainly not help provide the basic *public* investment which is so urgently needed to change the existing economic structure.

In any case, Bauer's prescription has little relevance to the development programs of the present popular and largely self-governing nationalist administrations. These have ambitious public investment schemes under way, to which most of the controls are intimately related. Moreover, there are articulate African trading interests to be reckoned with politically.

His favorite target is statutory marketing, and his criticism is merciless and consistent. The boards originated as wartime improvisations. They were retained as a reform of the chaotic prewar pattern, which was characterized by buying rings, a bewildering array of middlemen and moneylenders, and extensive producer indebtedness. The boards have fixed annual buying prices (of cocoa, palm products, and groundnuts mainly) and have accumulated large reserves. These have neutralized inflationary pressures of high export prices and have enabled a higher rate of public development expenditure. Bauer condemns the boards on the following counts: (1) They cut the link between the peasants and the world market; (2) they exact a high rate of forced saving from the producer in addition to a high tax rate; (3) by bulk-sales agreements they have sometimes realized less than the world price; (4) they inhibit private trading interests; (5) they have not defined stabilization precisely—consequently, price-volume relationships have sometimes *destabilized* incomes; (6) the accumulated reserves inhibit the development of private savings and investment; (7) steeply graduated export duties, made easier by centralized marketing, plus the anti-inflationary accumulated reserves, have made possible large-scale public development investments, the economic yield of which is, in his opinion, typically low; (8) low producer prices have restricted cocoa-planting expansion, driving world prices to record heights.

All but the last point are largely valid but essentially irrelevant. They make sense only on the assumption that domestic price stability, planned public investment, and the rational use of agricultural resources are secondary or even pernicious objectives. But domestic food supply is quite inelastic. It will remain so until fundamental agricultural research can prescribe a secure

substitute for the system of shifting cultivation. If producer prices, especially of cocoa, were not restricted, domestic food prices would skyrocket. Thanks to the boards' policies, this has been avoided, enabling development plans to proceed under more orderly circumstances. The reserves of course are still available for future price maintenance.

As for the effect upon cocoa supplies, Bauer neglects the facts that new plantings take seven years to produce, that there is little more good cocoa land, that much new planting nevertheless has been continually undertaken, and that stability of price is a more crucial incentive. In any case, indiscriminate extension of cocoa acreage could very well be disastrous to a precarious vegetation-soil-rainfall complex. Increased output must be sought in higher yields per acre (the boards finance the needed research), and in disease control and rehabilitation (the high costs of which the boards are meeting). Postwar prices are due to short supply, which has lagged because of disease and because planting was discouraged under the unpopular prewar "free" marketing arrangements. The boards cannot be held responsible for the price explosion.

Upon producer price control depend the development plans, the pending Volta River Project, the maintenance of political stability, and the possibilities of transforming a cocoa economy. Usually when such countries receive export-price windfalls, higher incomes and exchange earnings are frittered away, and disorderly inflation ensues. The countries are then castigated by Western economists as irresponsible. African leaders in the Gold Coast and Nigeria are, however, following another path, avoiding inflation, capturing and plowing back such windfalls into basic investment. For this Bauer accuses them of political opportunism and of exploiting their own voters. His strictures are consistent with familiar "free market" dogma, and consequently the many arguments in favor of the boards and their policies, in their specifically West African context, he dismisses. But these countries have different objectives from those of the unplanned economy of Bauer's dreams.

The boards and their policies have been retained by the new African administrations. They are politically supported by the populace, despite some local grumbling—often based, as in Ashanti, upon other political grounds. Bauer attributes this political acceptance to the demagoguery of politicians appealing to the "political" urban elements. But Prime Minister Nkrumah has twice overwhelmingly swept the rural Gold Coast cocoa areas in free elections.

To Bauer, economic development means whatever investment pattern emerges in the private sector of a "free" economy. But West African development requires enormous integrated investment scarcely imaginable under private auspices. Given the development objective, there are few alternatives to the boards' policies.

These criticisms aside, the book is a masterful organization and exposition of new and important material. The author should be especially commended for the impressive selection of statistical information.

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Statistics and Econometrics

Economic Activity Analysis. Edited by Oskar Morgenstern. (New York: John Wiley & Sons. London: Chapman & Hall, Ltd. 1954. Pp. xviii, 554. $6.75.)

This volume contains thirteen papers written under the auspices of the Economics Research Project at Princeton University, and financed by the Office of Naval Research. The papers are by J. B. Balderston, C. Bernstein, R. Bott, O. Eckstein, J. P. Mayberry, K. Menger, C. P. Modlin, Jr., O. Morgenstern, G. Rosenbluth, T. M. Whitin, Y. K. Wong, and M. A. Woodbury. The volume as a whole must be classified as mathematical economics, although there is one essay (by Morgenstern) which is not mathematical, and a couple of essays (in Part II) which are not economics.

Part I, with four papers, is concerned with input-output economics. The mathematical level is usually that of most papers in this field, and the papers should be of considerable general interest. The opening paper discusses briefly four models of general economic equilibrium, while the second deals in more detail with the Leontief input-output model. The last two papers are concerned with specific problems in input-output analysis, and will be discussed further below.

Part II, with seven papers, is entitled the "Mathematical Properties of Linear Economic Systems," and employs mathematics well beyond the reach of all but a very few economists. Furthermore, most of the problems considered are not interesting to economists, since they are primarily mathematical. The papers apparently develop new theorems about the mathematical properties of linear systems (although this reviewer is incompetent to assess the mathematical contribution), and these theorems should have implications for their economic properties. The fact that few of these economic properties have been developed does not mean that the work will not be useful to economics. Mathematical understanding of these systems, to which these papers contribute, must necessarily precede economic understanding.

Part III contains two papers. Menger discusses some of the logical implications of the laws of return, and Morgenstern discusses the future of "Experiment and Large Scale Computation in Economics."

The general economist will probably be most interested in Menger's paper on the laws of return. This is an outstanding example of how mathematics (logic) can and should be used in economics, and should be required reading for all graduate students who have taken freshman calculus. Menger notes that economists have made the following three statements about the laws of return: *A*. The output of a given piece of land cannot be increased indefinitely by the application of more labor, but reaches a maximum. *B*. An increase in the quantity of labor applied to a piece of land will increase the output of the land by a smaller percentage than the (per cent) increase in the quantity of labor, provided that the initial quantity of labor is large enough. *C*. A given increase in the quantity of labor applied to a piece of land will result in a smaller increase in output, the larger the initial quantity of labor, again provided that the initial quantity of labor is large enough.

Economists have, however, not been satisfied only to assert each of these propositions as true statements about the real world. They have further asserted: (1) that statements *B* and *C* are equivalent, *i.e.*, that *B* implies *C* and vice versa, and (2) that *A* implies both *B* and *C*. Note that these propositions have nothing to do with the real world: their truth does not depend upon any observable phenomena, but only upon logic. Thus it can be—and Menger demonstrates that it is—that statements (1) and (2) are false even though *A*, *B*, and *C* are all true. The lesson that Menger brings home is that we should use the tools of logic if we want to make logical statements.

Specialists in input-output will probably be most interested in the papers in Part I on the aggregation problem, and the problem of allocating trade and transportation charges in input-output models. The aggregation problem arises because it is not feasible to divide the economy into homogeneous industries. The number of industries in the model must be kept within manageable bounds by aggregating the industries into groups. Balderston and Whitin discuss the relative merits of some possible aggregation procedures, and also seek to measure the magnitude of the error which can be introduced by the aggregation procedure.

Trade and transportation charges can be considered as inputs either to the buying industry or the selling industry. Modlin and Rosenbluth discuss some of the theoretical problems involved, and the assumptions implicit in each method of allocating these charges. They also demonstrate that the results obtained from the model are quite sensitive to this allocation. In an 18-industry model for 1939, they find that the method of allocation changes their results by more than 10 per cent for over half of the industries.

Unfortunately, this volume has some of the defects so common to collections of this kind. The different parts of this volume are not directed at the same audience, or concerned with the same kinds of problems. Furthermore, there are times when the right hand apparently does not know what the left hand is doing. Thus we find in a discussion of the assumptions of the input-output technique on page 51 the familiar statement that the coefficients of production must be assumed stable, and in another paper on page 166 we are told, in passing, that, "of course," this assumption is not made. The reader would benefit if problems of this kind had been thrashed out before publication.

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National Income and Social Accounting

Long-Range Economic Projection. Studies in Income and Wealth, Vol. 16. (Princeton: Princeton University Press, for the National Bureau of Economic Research. 1954. Pp. x, 476. $9.)

To those who judge the worth of economics by its successful predictions, this collection of eleven essays offers evidence that only modest claims are warranted in the present state of knowledge. Although some predictions are attempted, the major emphasis is on techniques of prediction in the funda-

mental areas of productivity and labor force, as well as for fiscal policy, saving and investment, and also for economic sectors ranging from individual industries and agriculture to foreign trade and regions.

According to Simon Kuznets in the introductory essay, the basic premise underlying any forecast is "an identifiable relation between the future and the past, and a minimum of order in the past that can be translated into some specific pattern for the future." In short, a theoretical model consistent with historical regularities is required. In the absence of such a theory, the forecaster is obliged to extrapolate from historically established relationships with a high degree of uncertainty. Goodness of fit, however, is not a sufficient criterion of the usefulness of a function since a variety of functions each fitting the historical data equally well frequently yield widely different forecasts. William Fellner, who explores long-run projection of private investment, suggests that "the predictive usefulness of a theory depends in a large measure on whether it implies a useful separation of 'formal framework' from 'environment.'" This is so because "in economics true projectibility is at present a utopian goal," *i.e.*, no truly comprehensive model exists. To this extent Kuznets and Fellner are in agreement.

The difference between their respective approaches illustrates an important problem in empirical economics and one that is central to prediction problems. In the absence of a generally accepted all-inclusive theory, what weight should be given to the three ingredients inevitably found in any prediction: observed historical regularities, oversimplified theories and "subjective or quasi-intuitive judgment" as Fellner puts it. In the situation envisaged by Kuznets, where numerous hypotheses compatible with observed regularities yield widely different predictions, we select relations on the basis of incompletely tested theories and quasi-intuitive judgment. Fellner, on the other hand, uses an admittedly oversimplified model based on the acceleration principle to predict investment. He therefore puts the greatest emphasis on his interpretation of the *ceteris paribus* conditions since in his view the historically derived parameters are not to be taken too seriously because the parameters themselves are part of the self-adjusting mechanism of the economic system. Hence, the parameters are variables and the forecaster's main task is to judge how they are likely to vary during the forecast period.

The mixture of ingredients used in any projection depends on how much information exists. If the investigator has few observed regularities to work with, oversimplified theories and intuition must play a large, possibly a predominant role. However much reliance must at present be placed on intuitively based forecasts, it seems clear that scientific forecasting is possible only when more mechanical techniques are used because only with such techniques can we begin to track down sources of prediction error. As long as errors are principally ascribable to incorrect intuition, prediction will remain largely an individual matter, a state of affairs that most economists would not relish.

Several of the essays adopt an approach suggested by Kuznets to be an important technique for improving prediction, namely the selection of as many components "as there are sectors in the economy characterized by different

behavior patterns." Harold Wool's treatment of the labor force devotes much attention to the importance of the age and sex distribution for the labor force. For a ten- to fifteen-year period ahead predictions can be reasonably accurate because the youngest members of the labor force as of the prediction date have been born and mortality rates are quite stable. Many unknown sociological considerations become paramount in predicting fertility so that longer-term forecasts are much more uncertain; for example, whether the postwar "baby boom" becomes permanent, which Wool believes is likely.

The analysis of subaggregates also constitutes the focus of Harold J. Barnett's test of the forecasting prowess of input-output. He contrasts the prediction errors of an input-output model with those of a simple regression model (specific industry output as a linear function of gross national product and time) and two naïve models. Barnett finds that the regression predictions are superior to input-output projections while the other methods are somewhat inferior, though the results are not decisive. The only individual industry analysis, that of Paul Boschan, obtains regression estimates for aggregate steel requirements as a function of industrial output and an interestingly derived measure of industrial capacity. A potentially superior alternative to "building in" a measure of cyclical demand variation to account for changes in final output composition would be to attack the matter more directly through input-output. Another study of subaggregates is that of Walter Isard and Guy Freutel. They review some previous theoretical work in the field of regional analysis and present several novel ideas about regional projections and regional interactions. These studies exemplify a general trend toward the use of relatively small units of observation, primarily in recognition of the fact that the behavioral content of the aggregates becomes less and less apparent, the more all-inclusive are the data.

Two studies with empirical content that operate with more aggregative data are those of Fellner on investment and Rex F. Daly on agriculture. Fellner uses decade averages of total investment to derive marginal capital coefficients. These are assumed to be "normal" and are compared to current marginal capital coefficients and the current rate of growth in output in an attempt to determine whether the rate of capital accumulation is consistent with estimated increases in output and saving. Since investment behavior, either in inventories or fixed capital, or in different industrial sectors is likely to be governed by quite different factors, more accurate results might have been obtained had the author used more complete models relevant to the different sectors. Concerning agriculture, James P. Cavin appraises previous forecasts and Rex F. Daly presents a competent although conventional demand study for agricultural output and makes demand projections for 1975.

In addition to a thoughtful discussion of international account concepts, J. J. Polak sets up an equation system in which the long-run demand for imports of other countries is made a function of U. S. imports, each country's capital imports, its exports and its desired reserves. The exclusion of relative prices seems curious in light of widely held beliefs that while the short-run influence of price changes may be small, price effects are much more likely to be potent in the longer run. It might turn out that for prediction purposes

this approach is superior to a price-oriented theory of international trade, although this possibility has not been firmly established.

A succinct and critical appraisal of existing theories of long-run saving by Mary Smelker challenges the notion of a constant secular saving ratio on the grounds that the statistical evidence is inadequate and that the presumed stability of income size distribution does not stand up to close examination. The remainder of her study has been devoted to observations on how income distribution, age distribution, urbanization, the price level, financial assets and consumer durables might affect saving in the future.

Although projections may provide a very rough guide to policy, Arthur Smithies looks upon the possibilities of long-run projections with a sceptical eye, deploring "the amount of time and effort that is now going into the statistical computations of projections which may have little more validity than attempts to guess the height of the emperor of China." Therefore Smithies has concentrated on the impact of fiscal policy, particularly the influence of income redistribution on productivity.

While the volume makes a definite contribution to the topic of long-range forecasting, it is clear that more questions were asked than were answered. This is perhaps as it should be in a field where so little systematic work exists.

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Individuals' Saving: Volume and Composition. By IRWIN FRIEND with the assistance of VITO NATRELLA. (New York: John Wiley & Sons, 1954. Pp. x, 288. $5.00.)

National income statistics give personal savings as a residual of consumer income and expenditures. The Securities and Exchange Commission gives us the story behind this residual in terms of data on the changes in assets and debts making up savings. The savings concepts used by the two agencies differ in several respects, but this fact is incidental to the important fact that the SEC estimates provide information on the forms assumed by savings. Basic to the SEC series are liquid savings estimates, namely those of cash, savings deposits, insurance and pension reserves, mortgage and consumer debt. Other components of savings, namely home ownership and durable consumer goods, appear in national income statistics.

Estimating processes are described in Part II of the study. It is a story familiar to all economic statisticians, of the adaptation of inadequate source data, collected as by-products of legal and business administration, to a statistical problem of social import. One should not dwell on the inadequacies of the results and the need for better data until he has paid tribute to the ingenuity of the methods. These are imaginative and surprising, as fascinating in their way as studies of marine life in ocean depths, or development of binary-digit calculators.

Consider mortgages, probably the most important category of liquid savings, and one in which the data are better and Friend's methods less subject to criticism than in the others. To estimate this item it has been necessary to assume that: (1) recordings can be estimated correctly from sample volun-

tary reports, (2) repayments can be estimated from data of financial institutions and of government-guaranteed mortgages, (3) individuals and noncorporate business own all mortgages on one- to four-family dwellings other than those held by financial institutions, (4) individuals and noncorporate business own no mortgages on structures other than one- to four-family dwelling units. None of these assumptions is good. In a sense, Friend is challenging economists to do something about such conditions. Fortunately the challenge has not been ignored, since governmental and private economists and Congress itself are giving heed to them.

Although frank discussion of inadequacies of data and comparisons of data bearing on the same categories are better in this volume than in most descriptions of economic statistics, they are not satisfactory. They do not squarely face the problem of setting limits of accuracy. Consider, for example, the comparison of Commerce savings estimates and the SEC estimates. We have an extensive discussion of factors bearing on the comparison but we are not given an appraisal of the accuracy suggested by the results. This reviewer, making his own appraisal, judges that in the postwar period, both the SEC and Commerce estimates are probably correct on an annual basis within about 3 billion dollars on a total that varies between 5 and 25 billion. This is pretty good and argues more favorably for the accuracy of component figures than what we know of the figures themselves. On the other hand, the discrepancies in the two estimates are not serially correlated very closely, so that year-to-year changes may have larger errors than the figures for a year.

A need exists for new language developed out of statistical theory for treating errors in economic statistics. They should be considered as a standard error of an estimating procedure. Suppose category A can be judged to be correct within a certain limit a, with high probability, and likewise B and b. The error of A plus B can be intelligently discussed in terms of a and b and of the correlation of the two errors. Following naturally also is a concept of the errors of changes in time, that is of $A\ (t) + B\ (t) - A\ (t-1) - B\ (t-1)$. Any other language is awkward and misleading. Without the proper language error discussions must be mealymouthed.

Besides the statistical story, the volume gives us a summary of other findings on savings, and a somewhat cursory economic interpretation of the significance of personal savings. The author believes that investment-savings relationships are important in the explanation of movement in business conditions, stating his views in a Swedish-oriented manner. Had he stuck to this flexible expectational approach, he might have fared better than he did, but he apparently felt obligated to go farther and to embrace the Keynesian postulate of a stable savings function as a justification for his work. We are told: "The reason for focusing attention on the difference between income and consumption is—the belief that if there is a stable relation representing individuals' spending propensities, it is more likely to be between consumption and income than between total expenditures and income" (p. 13). But it turns out that "The precise nature of the saving or consumption function is not known, and there is still some question whether there is in any meaningful sense a stable saving-income relationship either in the short run or long run" (p. 152). Thus,

the findings are negative as regards the existence of a stable aggregative savings function. Moreover doubts are raised as to the usefulness of the savings concept itself. Perhaps, Friend seems to say, the various components of savings should be studied separately and independent of their status in the savings concept.

If we search for findings less fundamental but still of use as tentative hypotheses, we discover a wealth of them. The evidence is strong, for example, that the secular trend in personal savings propensities out of given incomes is either level or downward. Friend also shows that postwar savings can be well explained by regression equations based on savings out of real income in the prewar world. To be sure such equations have not met the acid test of use in forecasting under severe conditions, though they fared pretty well in 1953. Even if proved wrong, such equations have value, since the process of computation and correction of such equations must in itself broaden our knowledge of forces at work in the economy.

From the results of sample surveys of consumer expenditures, the author points out other tentative findings of interest. One which the reviewer found striking is the high importance in savings of entrepreneurial and management groups who seem to account for two-thirds of all personal saving. Friend emphasizes the probable interconnection of savings and investment behavior of such persons. Although expressing fundamental reservations about the results of sample surveys to date, the author considers the potentiality of the survey method as very great.

In Chapters 6-8 the author interprets historical savings data in broader economic terms. This falls short of the theoretical analysis seemingly promised earlier. He is content with a factual summary that hints at important conclusions. From 1929 to 1933, for example, individuals dropped their savings in securities, houses and consumer durable goods tremendously, but liquidated debt and protected their cash and deposit holdings to a surprising extent. This behavior indicated that persons enjoying sustained incomes were retiring debt and accumulating cash, while those with little or no incomes were powerless to lower their cash position or accumulate debt significantly. This suggests in turn that personal savings behavior would not have stabilized the national income at a low level à la Keynes, but in itself would have carried income right down to zero.

In the late 'thirties, high liquidity performance is the striking fact. We learn: "As compared to a negative or small positive figure in the late 1920's individuals' saving in the form of cash and deposits amounted to more than 55 per cent of the adjusted SEC total for the period from 1935 to 1940, and an even higher proportion of the smaller Commerce total" (p. 105).

If the reviewer understands Friend's postwar story of consumer behavior correctly, personal saving was a stabilizing factor in the main. Consumers seem to have contributed a good deal to the inflation of 1947 and 1948, but in the middle of 1948 helped bring it to an end through accumulations of cash and lowered consumer-credit borrowings. In 1949 high consumption and borrowing stabilized the economy by aiding production, and in 1951 their increased saving again acted to prevent inflation.

This book is primarily a source book of fact and summary of findings on savings in relation to income. Economic theory is used mainly to lend perspective and organization. The work should prove useful and stimulating to all empirically minded economists.

PAUL B. SIMPSON

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Consumers' Expenditure in the United Kingdom 1900-1919. By A. R. PREST, assisted by A. A. ADAMS. (New York: Cambridge University Press. 1954. Pp. xiii, 196. $7.50.)

This is the third volume in the *Studies in the National Income and Expenditure in the United Kingdom* published under the joint auspices of the National Institute of Economic and Social Research in London and the Department of Applied Economics of the University of Cambridge. It complements Stone's estimates for the period 1920-1938, the first part of which was recently published. The present volume, however, contains only basic data and virtually none of the demand analyses which were a prominent feature of Stone's work.

The items for which series are presented range from demersal fish (whatever that may be) to licenses for armorial bearings. Inevitably many of the estimates are based on very little firm information, although the author has made use of a wide variety of original sources. Perhaps the most interesting result which emerges is that from 1900 to 1913 real consumption per capita rose by only 4 per cent; in real food consumption per capita there was even a slight decline.

In an appendix an attempt is made to assess the reliability of the estimates. Though this assessment is itself dubious enough, the fact that it is there at all deserves praise. Another appendix is devoted to a reconciliation of Prest's figures for 1900-19 with Stone's for 1920-38, the principal difficulty being that Southern Ireland was no longer part of the United Kingdom during the second period.

Dr. Prest's bold and laborious calculations have resulted in a standard work of reference which will be consulted by economic historians and statisticians for many years. It is fitting that it should also be a masterpiece of printing.

H. S. HOUTHAKKER

Stanford University

Business Fluctuations; Prices

Business Fluctuations and Forecasting. By CARL A. DAUTEN. (Cincinnati: South-Western Publishing Co. 1954. Pp. viii, 518. $5.75.)

This textbook, as its title suggests, undertakes two major objectives, a discussion of the theoretical aspects of business fluctuations and a presentation of various methods of forecasting. The first part of the book is devoted to a study of the nature of business fluctuations. Some attention is given to the trend and seasonal pattern but major attention is focused on the cycle. Regional differences in the trends of various businesses and in their cyclical patterns are also considered.

There is a brief section devoted to the techniques of measuring changes in aggregative economic activity, production and prices. This is followed by a rather lengthy historical description of economic trends and cycles during the period from 1783 to the present.

The theoretical explanation of business fluctuations deals with a limited number of the major types of interpretation with more stress on those elements which are common to various theories than to the differences among them. The purpose of this section is the development of a synthetic approach to be used as the basis for forecasting.

One quarter of the book is devoted to the problems and techniques of forecasting including the projection of trends and various methods of forecasting short-run changes of general business activity. Considerable stress is placed on techniques of forecasting for an industry and for an individual business. The book concludes with a description of the services of various forecasting organizations.

The emphasis of the book is reflected in the fact that the first chapter deals with the role of forecasting in business management and the last chapter describes the services of the more important organizations engaged in publishing forecasts of total economic activity or certain special phases of it. The emphasis is also suggested by the fact that one very brief chapter (20 pages) covers a wide variety of programs for the achievement of economic stability while seven substantial chapters are devoted to forecasting.

The book should find its greatest usefulness in schools of business administration where stress is placed on the significance and the techniques of forecasting or in college courses with this emphasis. It will be of less use as a text in courses where primary stress is placed on theoretical interpretations of economic instability and programs for stability which might follow from such theoretical interpretations.

Each chapter is followed by a thoughtful list of selected readings and a list of questions of both the review and problem type. There is a teachers' manual available to those who use the book as a text.

James F. Cusick

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Money and Banking; Short-Term Credit; Consumer Finance

Private Credit and Public Debt. By Anatol Murad. (Washington: Public Affairs Press. 1954. Pp. vi, 195. $3.75.)

In this book, Murad develops a theory of credit, weaves it together with a theory of economic stagnation arising from a form of oversaving, and concludes that nothing, not even public debt creation, can save the capitalist system from ultimate collapse and socialism.

Part I of the book is an elaborate attempt to develop a theory of the origin and role of credit which relates credit creation to the fact that exchange is indirect; goods and services produced are not bartered directly for goods and services wanted. Credit arises out of such "uncompleted exchanges." This is followed in Part II by an analysis of the relation of credit creation to eco-

nomic growth. Net capital accumulation calls forth credit which will not be extinguished unless the economy contracts. This credit is represented by income-yielding securities, which provide "income without working" to savers. When savings, aimed primarily at obtaining income without working, outrun the desire of businessmen to invest, depression results. Such depression can be prevented only by the issue of more private credit to finance consumption, or by public credit. This situation, Murad contends, is the fundamental reason for the strong upward trend in the American public debt. War, he says, has not been the basic factor.

Part III argues that net capital accumulation must decline and crises must ensue in a capitalistic economy. In Murad's words: ". . . the portion of output devoted to net capital accumulation may be increasing the beginning of the industrialization process; at some point—the point of diminishing net investment—this proportion must begin to decline because of the ever-increasing demands of the production force on the available labor supply; ultimately these demands must become so great that all the workers are claimed by the production force [output of consumption goods, plus capital replacement], leaving none for the expansion force [capital goods expansion]; at this point, when full industrialization has been reached, net investment must cease entirely" (p. 149). Neither population growth nor technological progress, after an "advanced stage of industrialization" has been reached, provides hope that net investment can draw labor away from utilizing existing productive capacity. Saving continues, however, and only government issue of income-yielding credit can satisfy the demand of savers and postpone the collapse.

But even public spending can only postpone the evil day. Public net investment can no more obtain labor from current production than can private. Murad concludes: "It would seem, therefore, that we are doomed to depression and unemployment—unless we stop saving" (p. 167). The ultimate outcome must be socialism, when saving will cease and public credit can be eliminated.

Murad is to be commended for attempting to merge analysis of the credit system with that of the over-all behavior of the growing economy. But many economists will have grave doubts that he has succeeded.

The basic theory of credit developed in Part I seems to me to add little, if anything, to the more widely accepted understanding of society's credit-debt mechanism (as, for example, summarized in A. G. Hart's *Money, Debt and Economic Activity*), in spite of Murad's diatribe against a somewhat strawman "traditional exposition of money and credit." And serious questions arise in connection with his basic analysis of the process of growth and crisis in a capitalist society. I found several of his central points unconvincing. For example, he argues (without facing up to the statistics) that war has not been the major factor inducing the present large public debt; that saving in a full-employment economy is primarily (exclusively?) induced by the desire of savers for income-producing securities; and that net investment must cease as industrialization proceeds because all labor will be used up by already accumulated productive facilities.

This is a brief book which makes no pretense at presenting elaborate argu-

ment or extensive statistical evidence, but the reader is surely entitled to careful substantiation of such propositions as these. At no point, as far as I can understand the argument, does Murad explain convincingly why his central "principles of diminishing net investment" must even begin to apply, much less why net investment projects could under no circumstances in a "full industrialization" economy bid resources away from consumption goods activities. The supporting argument consists mainly of hypothetical arithmetical examples plus one brief table (p. 140) citing Kuznets' data on net capital formation in relation to national income from 1869 through 1938. The last fifteen years, which show a substantial upturn in the ratio of net capital formation to national income, are, significantly, omitted.

This book is intended as a treatise for economists and serious laymen. I found its basic thesis unconvincing. But the book is lively and stimulating, and Murad warns against the closed minds of present-day monetary economists. Readers especially interested in the fields of money and income-theory thus may wish to investigate Murad's argument for themselves.

G. L. Bach

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Banking Systems. Edited by Benjamin H. Beckhart. (New York: Columbia University Press. 1954. Pp. xviii, 934. $13.50.)

This book is a worthy successor to an earlier volume entitled *Foreign Banking Systems,* edited by Professor Beckhart and the late H. Parker Willis.[1] In view of the fact that developments in the area of money and banking have been so extensive since 1929, Beckhart quite properly decided against revising the earlier work and in favor of making a fresh start. As a result, an outstanding book which will be widely used for a number of years to come has been produced.

It will be of interest to those who are familiar with the earlier book to note that there has been some reshuffling of the countries considered. Specifically, Austria, Belgium, Denmark. Norway and South Africa which were included in *Foreign Banking Systems,* are omitted in the new book; and Brazil, Cuba, India, Mexico, and the United States which now receive attention, were formerly excluded. Other countries covered by the new work are Australia, Canada, England, France, Western Germany, Italy, Japan, the Netherlands, Sweden, Switzerland and Russia.

The commercial and central banking systems, savings institutions, urban and rural mortgage credit institutions, cooperative banks, and government credit agencies of each country are treated in detail; and money markets, where they are of significance, are also described. In addition, each section ends with a brief evaluation of the effectiveness with which the existing banking and credit institutions are meeting the needs of the economy of the country concerned.

The contributing authors are unusually well qualified to describe the monetary and banking systems of the respective countries to which they have been assigned. Most of them at one time or another have held private banking con-

[1] New York, 1929.

nections, and many of them have served in government in a financial capacity.

It would be unfair to single out specific sections of the book for attention unless sufficient space were available to permit a review of all of the contributions. The critical comments below, therefore, have purposely been kept rather general.

The discussions of a few countries include an excessive listing of legal references. These are likely to be of interest only to one who is pursuing a research project in the area, and the researcher could easily gather such references from other sources. The average reader is likely to be distracted rather than helped by details of this nature.

An extensive bibliography is listed at the end of the discussion of each country, but in some cases references to pertinent articles in English are not included. This is particularly regrettable in those instances in which there are articles that complement effectively the discussion developed in the book.

As is inevitable in a work of this type, some contributions were obviously completed a year or two earlier than others. Such chronological unevenness as there is would be significant only for the reader who had occasion to compare postwar developments in several different countries.

In a few instances, an unnecessarily detailed listing of the names of individual banks is included. These names will be foreign to and of little importance for most readers.

Finally, and most important of all, it is regrettable that contributors were not encouraged to devote more attention to the question of the relative effectiveness of monetary policies and controls during the period following the second world war. A modest reduction in the amount of descriptive detail and a somewhat greater emphasis upon policy matters would have made the discussion of the various countries more interesting and useful.

The above comments are not intended in any way to detract from the over-all excellence of the book. Indeed this is a work which the teacher of money and banking subjects will consider an indispensable part of his professional library. The price makes questionable the feasibility of requiring students to buy the book, but it will undoubtedly be used very extensively for library reference assignments in both undergraduate and graduate money and banking courses.

Coordinating the work of twenty different writers is a formidable editorial undertaking, and Beckhart is to be congratulated upon the skill with which he has guided the work. *Banking Systems* effectively fills a gap which has existed for some time in the money and banking literature.

William P. Snavely

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Monopoly and Competition in Banking. By David A. Alhadeff. (Berkeley: University of California Press. 1954. Pp. ix, 254. $4.50.)

This scholarly monograph represents a new approach to banking. In this study the techniques of economic analysis developed in the field of industrial organization and control for the main purposes of analyzing manufacturing industries are now applied to the banking industry. The main focus is on con-

centration in branch banking in California, but this case-study approach is set in a framework of banking market analysis not only for California but for the country as a whole.

The point of departure is the conclusive evidence of increasing concentration in California banking due to the favorable branch banking laws there. Whereas the four large California branch banks controlled less than 15 per cent of banking deposits in the state in 1920, by 1950 the ratio was nearly two-thirds. Furthermore, two-thirds of these Big Four deposits were concentrated in the Bank of America with over 500 branches, reputedly now the largest bank in the United States.

What are the effects of this increasing concentration on the various banking markets in California? In seeking to answer this question Alhadeff compares the functioning of the Big Four branch banks not with any theoretically ideal competitive market but with indices of performance of unit banks both in California and in the nation as a whole. The variables compared are output, price, costs of production and profits. The last are measured as: (1) net earnings on loans and investments, (2) net earnings on assets, and (3) net earnings on capital. In addition to comparing directly profits and other performance measures for branch and unit banks of different size, the author analyzes the impact of the large branch banks on three categories of banking markets determined by size of borrower.

Concentration in markets, product or banking, can not be determined simply by reference to the number of firms selling in a given market but only after consideration of the cross-elasticities of demand for all possible substitutes; in short, alternative sources of supply. Alhadeff fits his banking statistics into a threefold breakdown of borrower-loan markets by size of borrower so that his three basic categories for measuring the effects of banking concentration are the markets of large borrowers, intermediate-size borrowers, and small borrowers. The author concludes after examining his statistics that "intermediate-size borrowers in California face far more limited alternative sources of supply than in other parts of the country" (p. 53). Small borrowers face monopolistic or oligopolistic markets whether they deal with unit or branch banks and large borrowers can have recourse to the prime loan market which is, in effect, a national competitive market though subject to the revolving price leadership of a few large New York City banks. (This market is largely competitive because it is interrelated with other submarkets of the money market such as the commercial paper market, bankers' acceptances market, etc.)

The allegedly superior efficiency of branch banks in comparison with unit banks is examined by the author and found wanting. "For various reasons, branch banks do not earn more than unit banks on their loans and investments, and are only of average profitability in terms of their earnings on assets" (p. 192). Although branch banks are more profitable than the largest unit banks on any criterion of profitability, they are in turn surpassed on all three profits criteria by the penultimate size unit bank which is, in fact, the most profitable category of unit bank.

Much of the data in the book is presented in the form of annual averages

for each of the Big Four California branch banks (Bank of America, Security-First National Bank, American Trust and Anglo-California Bank) for the years 1938-1950 inclusive. And although the distinction is made between a legal area, such as a state, and an economic market area, it turns out that for most purposes the legal area of California is also the appropriate banking market area to consider. In general Alhadeff handles his data with theoretical sophistication and carefully compares his empirical conclusions with those which might have been expected from theoretical reasoning based on pure a priori assumptions.

There are times, of course, when Alhadeff seems to stray from the straight and narrow path, as when he asserts: "As a matter of statistical record, therefore, it would seem to follow that the most characteristic product of commercial banks as such is the provision of business loans" (p. 12). Unless for some reason Alhadeff does not regard the purchase and holding of securities as a characteristic product of commercial banks, this interpretation of the statistics is difficult to understand, since his summary Table 1 shows that business loans proper were only 21.4 per cent of the total loans and investments for member banks as of December 31, 1951. (Total loans were 45 per cent of all loans and investments.) Later, he sets the matter straight by referring to banks as multiproduct firms and by stating: "A bank's output can be divided into two main categories: (1) loans and discounts, and (2) investments" (p. 108).

One may also wonder whether or not the analogy of the banking industry with manufacturing industries is not sometimes strained a bit when one reads: "In banking, total assets are a rough gauge of 'capacity' and the ratio of loans and investments to total assets is analogous for banks to the load factor in hydroelectric plants" (p. 57). Why could not the traditional concept of an excess reserve ratio for member banks be used in discussing output performance of banks?

But these are minor imperfections in a work characterized by careful and objective scholarship. This monograph is, in short, an excellent book which can be heartily recommended as desirable reading for all advanced students of money and banking. Aside from the obvious merit of the substance of the book it makes a significant contribution to the application of economic methodology to the field of banking.

John A. Cochran

University of Illinois

Le Banche di Emissione in Italia nel Secolo XIX. By Giuseppe di Nardi. Vol. 8 of a collection of economic history and doctrines directed by Prof. Pasquale Jannacone. (Torino: UTET. 1953. Pp. xii, 436. L. 2700.)

di Nardi's book about the banks of issue in Italy during the 19th century does great credit to the author for the care and craftsmanship with which he has undertaken a difficult and laborious task. He has brought together and sifted a large mass of statistical and other evidence, much of it not readily available, bearing on the development of the Italian banks of issue, and he has told the story in a very stimulating and readable form. Interwoven with the reporting of actual developments is a good deal of discussion of contemporary thinking on banking questions as revealed in the minutes of Board of Directors

meetings and the annual reports of the banks, reports of the Parliamentary commissions of inquiry, in the economic literature and in public debates. For the most part the author lets the evidence speak for itself and refrains from judgments and evaluation; where necessary, however, he does point up flaws in the analysis of contemporaries and their misreading of the evidence.

The story of the period is presented in three main parts, which cover respectively the period before the unification of Italy and the establishment of a national currency, the period from 1866 to 1882 during which Italy had forced paper circulation, and the period from 1883 to 1893, which starts with the resumption of specie payments and ends with the banking crisis of 1893.

The books adds a new chapter to the history of central banking in Europe in the 19th century, and throws interesting light on the process of economic unification of Italy which is usually treated very sketchily in the more general books on the economic history of Europe. It also offers some interesting side glances on the working of the 19th century monetary systems, particularly bimetallism, in a country poor in capital, in a precarious balance-of-payments situation, and engaged in heavy military and economic expenditures to achieve and consolidate national unity. Italy furthermore was greatly affected by the major economic and financial events in the more important European countries, while at the same time it could not significantly influence those developments.

It is not surprising, therefore, that the history of the Italian banks of issue should present peculiar features of its own. These include the fight, throughout the period, of the regional banks of issue of the center and south of Italy against encroachment by the National Bank, which had been the bank of issue of the Piedmont and which, as the process of unification proceeded southward, gradually expanded its scope and influence, in part because of its special relation to the government to which it provided financial assistance; the clearing of bank notes among the banks of issue which, because of their different acceptability by the public, raised particular problems and difficulties for the five smaller banks; the fragmentation of the money market and the coexistence of several discount rates in the same area, the reluctance to use changes in the discount rate as a tool of credit control; the composition of the banks' portfolio and their increasing illiquidity because of heavy long-term investments in agriculture and industry and financing of the construction boom; as well as the almost continuous yielding to pressures for credit expansion and the consequent ignoring of those aspects of the domestic and international picture which at times would have suggested a different policy.

The history of the Italian banks of issue does not contribute much that is new to the understanding of the development and functioning of central banking. The contribution of the book lies rather in the light shed on the role of the banks of issue in the process of political and economic unification and development of Italy. Indeed one wishes that the author had put his account of the policies of the banks of issue even more squarely within the political setting of the period and the financial policies pursued by succeeding governments. This would also have brought out more clearly the extent to which government action or inaction and political forces were responsible for the

actual course of development of the banks of issue. The disregard of government regulations, abusive practices, the ability of the banks to pursue policies which were obviously not in the interest of sound economic development of the country or of effective central bank management and the ignoring of repeated if mild warnings of various commissions of inquiry, leading eventually to the crisis of 1893—all these features can be fully understood only in terms of the political climate, the reluctance and inability of the government to take forceful action and the influence of powerful pressures inside and outside of Parliament. As a result the benefits which political unity had brought about were seriously jeopardized in the economic field.

It is therefore difficult to agree with the author that the main theme during this period was the issue of monopoly vs. competition among the banks of issue. Although this was one aspect of the problem and a convenient slogan for the advocates of competition in which to clothe their more immediate, direct and particularistic interests, the argument that the eventual crisis was caused primarily by the excesses of competition is not convincing. As the author himself points out throughout the book, not only was there surprisingly little competition among the banks of issue in many fields, but the government, yielding partly to political pressures, deflected and blunted the impact of competition, slowing down and hampering the inevitable trend toward a unified and more efficient banking system and greater economic integration.

None of these comments is intended to detract from the significance of the author's contribution. The book not only adds an essential dimension to the economic history of 19th century Italy, but also contributes a novel and very interesting chapter to the economic history of Europe. One looks forward with interest to the second volume, promised by the author, which will bring the history of Italian central banking up to 1943.

Walter F. Stettner

U.S. Regional Organisation
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Money and Credit. Vol. 1. By Marinos E. Constantacatos. (Athens: "Hestia." 1953. Pp. xviii, 145.)

A merchant of Athens has set out, in this small book, to investigate the causes of price fluctuations in this country from 1800 to 1940. The author feels that all of economics must be rewritten—he is especially unhappy with Keynes—and this book serves as the first of a series of volumes toward this end.

He states that price instability is due almost entirely to deviations of the actual growth of the money supply from its "natural" or "divine" or "optimum" growth. The optimum growth is a function of population growth and the "rotation rate of generations," the latter being based on the average length of human life. The optimum growth rate, upon which the entire argument rests, is defined for the first time two-thirds of the way through the book. Even then, the reader will have to refer to a previous work of the

author for a clear statement of the concept. Nowhere does the author attempt to justify the use of the optimum rate, except to state that it flowed from instinct, and to back this up the reader is referred to the writings of Ralph Waldo Emerson.

If the actual rate exceeds the optimum rate of money-supply growth, prices rise; in the opposite case, they fall. The author calls this the Relative Quantity Theory of Money; it is a crude quantity theory in a growth context. The optimum rate is applied not only to the money supply as a whole but to each of its components: currency outside banks and demand deposits. (Actually, without realizing it, the author uses a series for total deposits, including time and savings deposits). The problem is to find which of the two components of the money supply is primarily responsible for price fluctuations. The solution to this problem, according to the author, tells us whether price instability is caused by central bankers (issuers of currency) or by commercial bankers (issuers of deposits). It turns out that deposits and commercial bankers had a stabilizing influence on the price level, and currency and central bankers had a disturbing influence. This result is attributed to "the intrinsic merits of the free market forces, Adam Smith's famous 'invisible hand.'"

However, it is impossible to disregard the influence of the author's hand in this conclusion. Suppose that in some year currency falls and deposits rise (relative to their optimum growth rates), while prices fall. Who is responsible for the price decline? The answer is the central bankers because they permitted the fall in currency, and by so doing denied sufficient reserves to commercial banks. Now, with everything else the same, suppose that prices rise. Whose responsibility is this? There are several answers, most of them commending or apologizing for the actions of commercial bankers. For example, commercial bankers in this case averted "the danger of a further fall in prices." Or, prices rose, not because deposits rose, but as a result of the Balkan Wars. And who can blame commercial bankers for that!

But it is not necessary to pursue this further. The problem itself is a sham. The two components of the money supply, throughout the period under investigation, have not been neatly split up this way between commercial bankers and "central bankers." One has only to recall national bank notes to realize this. Just as important, the implicit assumption that the amount of currency outside banks is solely at the initiative of the issuer is invalid. A "deficient" supply of currency may simply reflect the public's preference between the two components. Furthermore, the author assumes that the significance of currency outside banks is that it acts as the reserves of commercial banks, and this is not true either. It is difficult to think of a more inappropriate banking series with which to measure commercial-bank reserves than that of currency outside banks.

Aside from the component "problem," the analysis as an explanation of past price behavior is clearly deficient. The author's sole reliance on the transactions equation, $MV = PT$, will convince many readers of that. Within this framework, however, the explanation for changes in T in terms of population growth and the rotation rate of generations is woefully inadequate. Moreover,

changes in V are never considered. And when, according to the author's own standards, the wrong series for the money supply is used, the analysis becomes hopeless. All that remains intact is the price series.

We next find that the central bankers are not really to blame for price instability; rather it is the gold standard. The relatively slow growth of our monetary gold stock holds back the growth of central-bank liabilities. The latter in turn holds back the growth of commercial-bank deposits, and this results in a deficient money supply. If the central bank attempts to expand its liabilities unduly, the ratio of gold to these liabilities falls and the bank becomes illiquid. If commercial banks attempt to expand their deposits unduly, the ratio of their reserves to deposits falls and they become illiquid. Either way, the monetary system is doomed. The author illustrates this and allied points over and over again with literally hundreds of equations and numerical examples. The upshot usually is that by the year 2055, if not before, the whole system has blown sky high. "My conclusion is that under the existing credit management the outlook is truly ominous."

It may well be true that fifty or one hundred years hence we shall suffer from too little money if we insist on maintaining the present reserve requirements on both commercial banks and the central bank. Money-supply growth calls for the growth of central-bank liabilities (commercial-bank reserves) and, if reserve requirements on the latter are maintained, the digging implied by this may be more than the gold miners of the world will be up to. However, it is one thing to believe this possible, but quite another to argue that it spells catastrophe. If we cannot dig gold rapidly enough, surely we can create sufficient debt for the monetary system to purchase. Rather than worrying about the liquidity of the system, it would seem more important to concentrate on the alternative means of attaining a proper rate of growth of the money supply. If private debt is forthcoming, due to deficits in the private sector and surpluses in the government sector, commercial banks will probably be the purchasers of some of the debt, and this may necessitate a continual lowering of their reserve requirements. If, on the other hand, public debt is forthcoming, the central bank could be the heavy purchaser and at the same time could even raise reserve requirements on commercial banks. There are many combinations between these extremes. Over the long run, it is important to adopt the optimum combination of open-market purchases, treasury asset acquisitions, and reserve requirement changes that will bring about the proper rate of growth of the money supply. The choice of alternatives implies close cooperation between the fiscal and monetary authorities. It would not seem necessary for them to cooperate closely with the gold miners.

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Public Finance

The Theory of Fiscal Economics. By Earl R. Rolph. (Berkeley and Los Angeles: University of California Press. 1954. Pp. xiv, 310. $4.50.)

As the title indicates, this is a theoretical book containing little institutional

material. It includes chapters on the nature of government economic activities, social costs of government, government and social accounting, the monetary basis of fiscal theory and seven chapters on tax incidence in the broad sense. The analysis is careful, and the writing style is clear and forceful. Rolph had previously presented in journal articles some of the ideas developed more fully in this book and they have already aroused discussion. The book will doubtless receive a great deal of attention from public finance specialists and seems likely to excite some controversy.

The chapter on social accounting sets forth a well-reasoned argument for treating both public and private interest payments and dividends as transfer payments. Rolph rejects the factor-cost method of valuing national product or income on the grounds that it is uncertain that so-called indirect taxes in fact raise prices and that, in any case, price increases should not be concealed, whatever their cause.

In the chapter on monetary theory Rolph contends that private expenditures depend on stocks or assets rather than on income. This conclusion is supported mainly by the argument that income of any period cannot determine consumption (or investment) of that period since two contemporaneous events must be causally independent of each other. Although most economists would probably now concede that wealth or liquid assets as well as income influence consumption, it seems extreme to discard income altogether as an explanatory factor.

As regards incidence, Rolph sets for himself the praiseworthy objective of rescuing the topic from the status of "a series of footnote thoughts on price theory." The great merit of his treatment is his consistent emphasis on general equilibrium or aggregate demand implications. Perhaps his most startling statement is that excise taxes are not shifted to consumers but instead reduce factor returns. He argues that a general excise tax is deflationary and hence will not raise the price level. Furthermore, it will not change relative outputs or prices because there is no untaxed employment to which factors may go when their money returns are reduced. These points had occasionally been recognized, notably by Harry Gunnison Brown, but Rolph deserves credit for developing them more fully. He goes much further, however, and extends the argument to selective excises. A tax on a particular commodity will cause nonspecialized factors to shift from this industry to other employments, and returns in these fields will be forced down. If aggregate money demand and real output remain constant, the tax proceeds will all come out of factor returns and a wide range of industries will be affected. But this reflects only an accounting identity: final expenditures equal factor returns plus excise taxes. It does not necessarily mean that the "burden" or incidence of the excises is on producers. Could we not equally well say that commodity taxes are always paid by buyers since their outlays cover both factor returns and taxes? I am not sure under these circumstances whether it is profitable to discuss whether producers or consumers as a group bear the taxes, but I do feel that Rolph is justified in insisting that the conventional treatment is oversimplified.

The surprising omission is Rolph's failure to consider systematically changes

in relative prices and factor returns. These changes represent tax shifting in the traditional sense and their determination has usually been regarded as the study of incidence. A tax on a particular industry will raise the relative price of its output, unless factors employed by the industry are so highly specialized that they are unable to transfer to other employments; and it will reduce relative factor earnings in the industry, unless the factors are unspecialized and highly mobile. Persons whose tastes run toward consumption of the taxed commodity will be taxed more heavily than other consumers, and owners of specialized factors will be penalized. Surely the beer drinker is right in believing that he is being taxed by the excises on beer and the fur worker in believing that the excise on fur coats depresses his wages. The traditional theory of incidence, which is only an application of price theory, concentrated attention on such changes in relative prices and factor returns. More distant repercussions were neglected, in conformity with the usual partial-equilibrium method. It was not always recognized that this partial-equilibrium theory of incidence, although applicable without serious limitation to small taxes, could not be easily extended to taxes of wide coverage and large yield or to a large group of small taxes considered jointly. Rolph's treatment is a useful corrective for this shortcoming, but in my opinion he goes much too far in discarding traditional incidence theory when he refuses to grant that an increase in relative price of a commodity constitutes "shifting" of a tax to consumers of that commodity.

In discussing import duties, Rolph rejects the proposition laid down by Mill and endorsed to a limited extent by Marshall that these taxes fall partly on foreigners, although he agrees that the duties may turn the terms of trade in favor of the country imposing them. Foreigners do not pay money directly or indirectly into the treasury of the taxing country and hence, according to Rolph, cannot be said to bear the import duties. In the taxing country, Rolph believes that import duties fall on exporters or other producers rather than consumers of imports. Exporters are "taxed" if the duties cause the value of imports (exclusive of tax) to decline, since export receipts cannot in the long run exceed payments for imports. This treatment seems to me to imply too literal an interpretation of the meaning of "taxing the foreigner" and again demonstrates Rolph's refusal to classify a change in relative prices as tax shifting.

Rolph's conclusions regarding the effect of taxes on the incentive to work seem to be close to those that are now rather generally accepted, although the manner of statement may suggest more novelty of substance than I believe actually exists. He accepts the proposition that an income tax lowers the price of leisure and hence, from this point of view, tends to cause people to work less. He also agrees that if a tax reduces the real income of a person it will for this reason give rise to an offsetting tendency to induce more work. He differs from most other writers, however, in stressing the price effect and minimizing the income effect. He argues that for society as a whole taxes serve only to prevent inflation and impose no real burden; the real burden is due to public expenditures. Rolph concedes, however, that taxes may redistribute income and thus have income effects that will partly or wholly offset price effects for certain groups.

In the final chapters, dealing with taxes and investment, Rolph presents a highly sophisticated analysis of tax capitalization. He shows that many discussions are faulty because they are confined to the effect of taxation on expected future yields of assets and take no account of the (usually offsetting) influence on rates of capitalization. I find it quite impossible, however, to accept his conclusion that, under conditions of certainty, taxes will have no effect at all on the rate of investing. This conclusion is based on the flat assertion that people save and invest in order to become wealthy and not to earn a return. Granted that wealth may be desired in itself, surely the possibility of receiving an interest return is an additional motive for saving. Even with the speculative motive for holding cash ruled out, it is hard to see why savers would go to the trouble of investing instead of hoarding if investments offered no return.

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International Economics

The Economist in the Twentieth Century: And Other Lectures in Political Economy. By LIONEL ROBBINS. (New York: St. Martin's Press. 1954. Pp. xi, 225. $3.50.)

This collection of lectures, delivered in Rio de Janeiro and elsewhere, deals mainly with problems of international readjustment. Professor Robbins here adds his contribution to the recent array of small but distinguished works—by Robertson, Harrod, Hawtrey and other English economists—on the great postwar disequilibrium.

Inflation in the deficit countries is the villain of the piece. The fiscal methods of inflation control, which Keynes outlined in *How to Pay for the War,* are seen to be subject to serious practical limitations. Failure to use more promptly the tools of monetary policy receives the major blame, but there is hardly any discussion of investment compared with consumption as the proper object of retrenchment. The prescription is: stop inflation, correct the exchange rates. There is full confidence in the efficacy of exchange rate changes; statistical estimates of low elasticities are dismissed as worthless. The author strongly favors, however, the International Monetary Fund's "adjustable peg" procedure, with exchange stability the rule rather than the exception. In his view it is a mistake to rely on continually fluctuating exchange rates as an automatic means of equilibration (pp. 97-101). In the use of import restrictions by deficit countries Robbins admits the case for—at least temporary—discrimination against the surplus country (pp. 57, 144). On the question of sterling convertibility his stand is cautious, because reserves are uncomfortably small. He favors a general increase in the price of gold as a way of restoring international liquidity, but regards it as impracticable at present because of U.S. objections. In place of European union, which he considers too narrow a goal to be attainable, he demands nothing less than integration of the Atlantic Community.

Robbins' views will command wide agreement, though naturally, over so vast a range, there are points to which some will take exception. The author is right when he castigates the habit of keeping domestic and external policy

in closed compartments, but to my mind he goes a little too far in treating a high level of employment and equilibrium in the foreign balance as incompatible. Besides, he devotes a whole chapter to criticizing Beveridge's employment proposals without mentioning the 3 per cent ratio which Beveridge proposed as the normal rate of unemployment, a goal that has turned out to be conservative compared with the actual ratio of 2 per cent or less that has prevailed in England since the war. In the classical theory of commercial policy Robbins perceives a disquieting flaw: the case for unilateral free trade is weakened, in his opinion, by the fact that tariff reductions by one country alone will have deflationary effects on that country's domestic economy, whereas with reciprocal reductions losses are counterbalanced by gains (pp. 135-40). The argument seems incomplete, the concession unfortunate. If employment theory reveals a flaw, that theory can also take care of it, by showing the way to realizing the classical assumption of full employment. Especially for a country with a strong balance of payments there is nothing to prevent the offsetting by means of internal expansion of any deflationary pressures arising from unilateral tariff cuts.

Apart from Beveridge, the only living writer cited more than once is Jacob Viner, "that fine economist and true citizen of the world" (p. 167). Views criticized are generally attributed to "some high authorities" or to other nameless—and consequently somewhat shadowy—characters. The author evidently prefers to stand, urbane and dignified, above the fray of current controversy.

The book begins with some very interesting reflections on the growth in the demand for economists and for the teaching of economics in the last fifty years, and ends with an essay on the British war economy, in which British economists, including Robbins himself, played such an outstanding part.

RAGNAR NURKSE

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An International Comparison of National Products and the Purchasing Power of Currencies. By MILTON GILBERT and IRVING KRAVIS (Paris: The Organisation for European Economic Co-operation. 1954. Pp. 203. $3.00.)

This is a prodigious piece of work and an honor to its authors. It is one of the few major pieces of empirical research done in the field since Carrol Wright's work in 1885. Here is a forthright discussion of the methods and problems of comparisons of the gross national products of different countries, plus a detailed showing of the results of one such comparison. The findings will undoubtedly be put to substantial use in international negotiations.

The study is designed to provide "some quantitative measure of the relative economic strength" of member countries of the Organisation for European Economic Co-operation (pp. 13, 64); to "measure the relative economic ability of the five countries to meet the requirements of present-day existence" (p. 18); to assess "the productive ability" of the countries involved (p. 61). Clearly these are all versions of a single purpose. The goal is achieved by binary comparisons of "the flows of final goods and services in the two countries" (p. 63)—namely, the United States and United Kingdom, United States and France, United States and Western Germany, United States and Italy. These

comparisons were made by identifying and pricing "about 250 goods that were comparable in the two countries" (p. 77). The purchasing power equivalents thus computed for a given product—European currency units per U. S. dollar—were weighted together and applied to GNP product class totals—for cereals and cereal products, laundry, dry cleaning, and so on. Data on comparative GNP totals and components, as well as on purchasing power equivalents, are reported for each country both at average European and at United States price weights. The key point of the operation was the direct field collection of prices in the various countries for clothing and shoes, with extensive detailed pricing from unpublished and published official sources for other items. Nearly 80 pages of notes indicate the complexities of the pricing process thus briefly summarized.

Among the major findings of the study are the following:

A. The usual conversion of national product data by exchange rates (as is done, for example, in assessing contributions to the United Nations and other international organizations) has "severe limitations" (p. 16). It tends to understate the internal purchasing power of the national currencies for the items composing their national output. Thus the output of the 4 European countries totals about 50% of the United States total when converted by purchasing power equivalents in this study as compared with only 40% from United Nations conversions.[1]

B. The gross product of the United Kingdom in 1950 (valued at a geometric average of United States and United Kingdom relative prices) amounted to 19.2% of the United States total. For France and Germany the totals ran to about 12%, and for Italy, to 8%.

C. On a per capita basis the United Kingdom's output was 58% as great as the United States'; the French, 48%; the German, 38%; and the Italian, 26%.

D. Data are shown in extensive detail for GNP valued separately by United States and by foreign prices. The "use of United States price weights produces national product figures that are higher by 20 per cent for the United Kingdom, about 25 per cent for France and Germany, and 40 per cent for Italy, than the estimates derived by means of the European price pattern—the base figure in all cases being the actual United States gross national product" (p. 25). A shift in weights from United States to European produced no change in the product totals for some items (domestic service) and a change of more than 100% for others (vegetables and fruits in Italy).

E. An astute discussion of the relationship between quantity and market price ratios indicates the impact of relative prices and output. For autos and other consumer durables European prices are relatively high (high purchasing power equivalents) and consumption relatively low (low quantity ratios). For food, differences between European and

[1] United Nations data from United Nations, *National and Per Capita Incomes of Seventy Countries in 1949*, Statistical Papers, Ser. E, No. 1. Gilbert and Kravis give a figure of 35% rather than 40%—which they derive by using actual exchange rates. In practice the United Nations has used an adjusted exchange rate for the United Kingdom.

United States prices are much less and differences between European and United States consumption levels are much smaller.

Which components primarily account for the per capita gross product in the United States being $674 (or more than 50%) greater than the United Kingdom's and $1,262 (or more than 200%) greater than Italy's? They are actually few in number. In consumption—clothing and household goods, transportation, and miscellaneous. In investment—producers durables. In government—defense. The GNP differences for food, housing, health, education and recreation account for only a small part of the wide gulf between the United States and European GNP. (They are, of course, substantial on an item comparison basis.) The difference in investment expenditures is perhaps the most striking single difference. However, these investment differences are gross, comparable depreciation data being nonexistent. Net investment differences might be less, given the greater body of capital equipment in the United States.

The major contribution of this study is certain to lie in the wealth of detail on GNP components and purchasing power equivalents in the five countries studied. This detail enables the reader to make his own combination of components, and direct his attention to specific items. It is nevertheless worth speculating how well the report answers the questions which it set out to deal with—(1) What is the "relative economic strength" of these four OEEC partners as compared with that of the United States?; (2) What is the relative ability of these countries "to meet the requirements of present-day existence"?

1. References to "relative economic strength" (p. 1) and to efficiency "from an economic standpoint" (p. 25) are made in the context of "real comparisons of national and per capita products." But just what does a comparison of GNP totals tell us about strength, about efficiency? How many officials who compare these GNP totals will understand that one country will have more "economic strength" than another in proportion as it has a more complex financial system (more checks used, more services of financial intermediaries); higher interest rates (more interest paid); more barratry (more legal services); and more residents who take thought of the morrow (more expense of handling life insurance)?[2]

The root of the difficulty lies in the fact that while all legal marketed products enter into the GNP total, the resources used for certain categories of production are committed to that particular use—and are not available for other uses, such as defense output. Comparisons of the economic strength of members of international organizations must reckon with that distinction: resources used in making $100 worth of automobiles may be available for making $100 worth of tanks, but $100 worth of vaudeville services may be quite unusable for any other purpose.

A second difficulty lies in the fact that GNP measures output rather than potential—though the latter is implied in reference to "productive ability"

[2] It is clear that production, of any item, will require the use of real resources and it is for this reason that any legal marketed item is included in the GNP total—whoever the estimator.

(p. 61). Actual output, of course, is a fact, and perhaps the best single measure of capacity. But these are not identical; and this is particularly important where a country may be undergoing substantial economic or administrative change. Thus comparisons of Italian GNP with that of other countries measure productive ability less well than do comparisons for the United Kingdom. Changes in land tenure may bring marked jumps in productivity and hence in output—as the experience in more than one underdeveloped country has indicated.[3] (Even within the confines of this study, of course, one may note the dramatic gain in the German gross product from 1950 to 1952.)

2. A second stated goal of the OEEC report is to "measure the relative economic ability of the five countries to meet the requirements of present-day existence" (p. 18). There is, of course, a broad similarity between the structure and goals of these five economies. But the contribution of this study is beyond the pointing out of broad differences in GNP. It lies, rather, in the measurement of GNP in dollars, and purchasing power equivalents to three significant places. In such a context one may question whether there is a single set of requirements of the kind which would warrant using the GNP totals and purchasing power equivalents for international negotiation.[4]

An extensive argument has taken place about the contribution of distribution per se to economic welfare. The OEEC report takes the only feasible path and includes such costs in GNP. But it is to be hoped that future editions will segregate an estimate of distributive margin so that users can appreciate how this item contributes to GNP differences. Using the ratio of income originating in trade to gross domestic product as a fair approximation of trade margins, one finds that the trade margin differential between the United States and Italy, for example, contributes as much as does the spread in investment to differences between the two countries' "comparative economic ability to meet the requirements of present-day existence."

A further complication is the traditional one that GNP measures only those items which come within reach of the measuring rod of money. Few people would confound the national accounts in a vain attempt at complete inclusion of all nonmonetary items. But equally we must recognize that differences between the United States and these other countries, particularly Italy, are affected by such elements. One of the major differences in consumption, for example, is the "miscellaneous" category, of which a substantial component is interest. Because we "net out" intrasector transactions in computing GNP we recognize a larger share of money lending in the United States (where small-loan companies are incorporated) than we tend to in Italy (where the money lender is more apt to be an individual). Similar considerations apply to consumer expenditures for betting (pari mutuel versus small-scale betting)

[3] *Cf.* Walter Heller in Haskell Wald, ed., *Papers and Proceedings of the Conference on Agricultural Taxation and Economic Development* (Cambridge, Mass., 1954), p. 236. The expansion of the national health program in the United Kingdom led to a 13% rise in medical consultations—a rise which would narrow the United States-United Kingdom GNP differential if medical consultations were priced on an item basis. (Actually the OEEC study simply compared the number of physicians per capita for this component of GNP).

[4] This problem, of course, is equally present when we use exchange rates or international units for deflating national income totals.

for moving (transportation companies versus transactions between individuals) and so on. In sum, we can less accurately speak of these GNP totals measuring "the relative ability of these countries to meet the requirements of present-day existence" than we can say: the United States comes closer to meeting the requirements of present-day existence in the United States through the market mechanism than Italy comes to meeting the requirements of present-day existence in Italy through the market mechanism. The revised statement is somewhat more tautological; it is nevertheless more accurate.

Having considered some of the points which must be borne in mind in using the GNP totals in this report for international comparisons of economic strength and ability to meet present-day needs, we must go somewhat further. For the nature of economic development may well be such that there is a broad correlation between the growth in margins, in services and in the basic investment components which are traditionally the measure of economic power. It may be of interest to those accustomed to use iron and steel output as a simple measure of "economic strength" to compare the results of the OEEC study with the production of crude steel in 1950:

Production of Crude Steel		GNP Valued at Geometric Average of US and European Prices (Gilbert and Kravis)
United States	100	100
United Kingdom	19	19
France	12	13
Germany	14	12
Italy	3	8

The results are strikingly similar except for Italy.

To judge the validity of the Gilbert-Kravis findings one should have spent at least a hundredth as much time in detailed research as have the authors. Certain comments can nevertheless be ventured.

A. The findings of this study are broadly consistent with certain earlier reports. Thus, for example, the Gilbert-Kravis results indicate that United Kingdom consumption in 1950 was roughly 66% of United States. A small-scale study by Adler and Paige for 1948 indicated a ratio of 63%.[5] And the pioneering study in the deflation of GNP, done by Copeland *et al.* for the Combined Production and Resources Board suggested a ratio somewhat above two-thirds for 1943.[6] United Nations comparisons imply a markedly smaller ratio—but conceptual differences could easily account for the difference.[7] The comparisons made by the U. S. State Department in computing foreign

[5] S. Adler and D. C. Paige, *International Comparisons of Consumption* (Cambridge, 1952). Data are taken from Table 2 of this mimeographed study.

[6] Combined Production and Resources Board, *The Impact of the War on Civilian Consumption in the United Kingdom, the United States and Canada* (Washington, D.C., 1945), pp. 1, 193 5.

[7] United Nations, *Retail Price Comparisons for International Salary Determination* (1952), Ser. M, No. 14, pp. 23, 27, 39.

service allowances, the ILO food comparisons, Colin Clark's most recent estimates—these and still other data could usefully be summarized and compared by the authors in a subsequent edition of this study.

B. The basic findings on purchasing power equivalents seem consistent with exchange rates. Thus the United Kingdom exchange rate in 1950 was .357 pounds per dollar—as compared with a purchasing power equivalent for the entire GNP shown here of .288 (U. S. quantities). But the equivalents reported here for clothing and textiles and for producers durables are .316 and .303—or close to the exchange rate, and such items are likely to be representative of major segments of United Kingdom exports. For Germany the exchange rate was 4.20 marks per dollar. The report finds equivalents of 4.26 for coal and 4.42 for producers durables—items which we may take to be reasonably representative of the volume of Germany's coal and metal product exports. One of the major findings of the report is a demonstration that by adding together *all* the items in the national product—food, housing and so on—one arrives at GNP purchasing power equivalents in these four European countries which are markedly better than rates for the particular components which move in foreign trade.

C. The differentials between purchasing power equivalents are sensible for the chief components of the national product. They run in line with the influence which one would expect heavier United States capital investment and greater productivity to exercise. Our relative advantage over other countries is less for those products where labor is the dominant cost, rising steadily as the degree of fabrication increases and greater United States capital investment begins to have its impact.[8]

D. What can we say of the results on their own ground—that of internal consistency? Again, the vast bulk of results are reasonably consistent. A baker's dozen, however, are perplexing. The items designated are those where the relationship of one set of equivalents to the other may be quite reasonable to those acquainted with the country and the data but do raise questions on a priori grounds.

Why, for example, should ratios for entertainment and for "other recreation" be so far apart in Germany and Italy—particularly considering that the entertainment ratios were used in deriving the latter?

Since laundry and barber shop services were directly priced in all countries, and since the overwhelming portion of the price in each instance must be average earnings of proprietors, it is hard to understand why the near identity of ratios in the United Kingdom is so totally absent in Germany and Italy. (Domestic service equivalents—though derived by different means—give ratios very similar to those for barber shops, very different from laundries.)

Why should the housing and residential construction ratios in France and

[8] Particular points, of course, are out of line. It is puzzling why the United Kingdom's purchasing power equivalent for meat and fish should be relatively so advantageous given the heavy volume of meat it must import. It is somewhat more puzzling why the French should apparently be such inefficient producers of shoes. Perhaps the fact that no data were available for this item from official pricing for the French cost of living index, with reports based only on direct pricing (p. 135), may have been responsible.

Italy be so far apart? Does the lower purchasing power equivalent for housing amount to a startling reflection of rent control?[9]

Both nonalcoholic beverages (tea, coffee) and tobacco are imported products in these countries. Yet while both products are above the consumption average in Germany and Italy one falls much lower in the United Kingdom and the other much lower in France.[10]

The ratios for purchased transportation equipment—essentially automobiles—and for producers durables were virtually identical in France and Italy, but diverged widely in the United Kingdom and Germany. Since motor trucks are included in producers durables (presumably with substantial weight) and since automobiles dominate the former group, the reasons for such differences constitute a fascinating question. It is to be hoped that a subsequent edition will give the individual equivalents developed for trucks and other classes of producers durables. We could then determine whether it is weighting that produces this result, difficulties in the procedure of using cost of passenger car per kilogram, or some other circumstance. Since the authors used prices of producers durables in deflating defense goods expenditures, the differences between these two sets of data are also of interest. (Presumably the sharp differences reflect relatively small amounts of equipment being purchased in France and Italy.)

One of the more questionable relationships between purchasing power equivalents is that between total food and the vegetable and fruit group in the United Kingdom and France. That these two countries should appear to be relatively such inefficient producers of fruits and vegetables is a striking presumption worth further study.

E. Almost inevitably the study systematically tends to understate the internal purchasing power of European currencies and the comparative GNP of the four countries. This is so despite the authors' manifest intentions and extreme care. It occurs because of a tendency to write off the greater volume of services and the higher level of quality characteristic of certain European goods.[11]

In summary, this major study should supersede a variety of less careful, less thoughtful, measures. It puts the onus on those who prefer to use exchange rates to deflate national incomes rather than the "equivalents" developed here with such admirable care and effort. And it provides a storehouse of data on differences which prevail between the production patterns and price relationships of these five countries. It is to be hoped that future editions will extend comparisons to still other OEEC members. It is even more to be hoped that, free of the inevitable limitations on an official study, the authors will collabo-

[9] In future editions it would be desirable to measure residential construction cost differentials not merely from the cost of specified brickwork, painting and plastering operations (pp. 194-95) but also to include some allowance for carpentry—the latter accounting for a much larger share of construction costs in most countries.

[10] The ratios shown for tobacco are those at factor cost—hence neither subsidies nor taxes should be a factor here.

[11] *Cf.* p. 88 for a thoughtful discussion of the reasons why some of this is necessary.

rate in a private study of the economic implications and meaning of the materials they have so laboriously and brilliantly put together.

STANLEY LEBERGOTT

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American Foreign Assistance. By WILLIAM ADAMS BROWN, JR. and REDVERS OPIE. (Washington: The Brookings Institution. 1953. Pp. xii, 615. $6.00.)

From 1941 through 1952 the United States extended to foreign nations nearly $100 billion in foreign assistance. The funds involved were granted under many labels, for a variety of purposes, and under widely divergent conditions. To recount the history of this unprecedented international flow of funds, and to assess its effectiveness, is the task undertaken by the authors of the volume under review.

Clearly, no study of such scope can satisfy the individual curiosities of all readers, but one can predict without cavil that this will be a standard work on the subject for years to come. It brings together data from a wide range of sources and presents them in intelligible and useful form; it weaves a coherent history of the events and of the motives which prompted such largesse; and it singles out a number of places where American actions may not have been optimally attuned to long-range American interests.

The story, as unfolded here, is one of the reaction, sometimes sluggish and sometimes impetuous, of United States policy to changing conditions in the world of international affairs. Wartime assistance began with a trickle, but became a flood with America's entry into the conflict. Postwar assistance was initially based on the notion that transitional relief was all that was needed, but gradually shifted to the larger-term aims embodied in the European Recovery Program. These aims, themselves conditioned by mutual security motives, were in turn modified after the Korea outbreak, when more strictly military objectives again became dominant.

The appraisal or critique of the programs given by Brown and Opie stays broadly within the framework of the history. The early wartime efforts were too niggardly; recent emphasis on military as opposed to economic assistance may be too short-sighted; during the recovery program period emphasis was placed on prospective dollar deficits rather than the prospective contribution of additional funds to the economic strength of the free world. In addition, the authors take potshots at American attempts to tie strings to grants: for example, the provisions of the Economic Cooperation Administration requiring priorities to be given to the United States as a source of supply for agricultural commodities declared "surplus" here, the provisions regarding shipment of ECA cargoes in American ships, and the arbitary restrictions on East-West trade that have from time to time been built into the assistance machinery.

As may be evident from the above, this volume is essentially a history written by economists with good professional insight and judgment. It is not, and does not pretend to be, an economic analysis of the effects of American assistance on the war effort, the recovery of Europe, or the recent defense mobilization. Accordingly, those who want to know how many of the billions

given in foreign assistance were "wasted," and in what sense, or whether particular branches of our aid program should have been expanded at the expense of others, will have to wait for further studies in this vast and relatively unexplored field.

ARNOLD C. HARBERGER

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Germany's Comeback in the World Market. By LUDWIG ERHARD. (New York: Macmillan. 1954. Pp. 271. $4.50.)

Western Germany is not a free-trade country, inasmuch as its tariff barriers remain relatively high; but it led the European nations in dismantling the prevailing system of import quotas when the European Payments Union offered the opportunity. If the author, Ludwig Erhard, German Minister of Economic Affairs and professor of economics at the University of Bonn, could have his way, currency convertibility, the abolition of import quotas, and the establishment of realistic exchange rates, as well as unconditional most-favored-nation treatment, would be objectives to be achieved by all nations as soon as possible.

Erhard's economic credo pervades the whole book, which was prepared in the foreign trade division of the Federal Ministry of Economics under Herbert Gross as director of research; however, the study is largely a chronological account of German foreign-trade policy, from its postwar beginnings in the three Western zones of occupation, through the summer of 1953, when the book was first published in the German language. Great stress is laid on the importance of trade and clearing agreements in Germany's expanding trade, and considerable space is devoted to the part played by such agreements in helping to solve problems relating to specific countries and currency areas, and in creating new opportunities for German trade. The book should therefore be very useful for anyone dealing with German foreign-trade questions, since the background information and discussion of procedure are extremely comprehensive and are accurately done. However, while focusing on the institutional framework of Germany's trade relations as it evolved after the war, the book only in passing treats certain basic factors such as Germany's monetary reform and its monetary and fiscal policies, which appear to have contributed even more to the country's comeback in the world economy than has the institutional framework.

Interesting from a historical point of view are the sections on foreign trade policy under the Allied Military Government, a period now almost forgotten. The study is quite critical of Allied Military "bureaucracy," holding that it tended to hamper German advances in foreign trade during that period. It acknowledges, however, that prior to the establishing of a sound currency by the currency reform of 1948 (which Erhard helped to prepare), not even "superpatriots" could have achieved a larger volume of trade; it also gives credit to the United States as being the only one of the three Allied powers that urged from the very beginning a return of foreign trade to private hands.

As for the future of German foreign trade, Erhard sees Germany's great opportunity in the expanding markets created by the desire of the less-developed nations for greater industrialization. Germany's technological genius

and its ability to produce the desired equipment should promise a great future for German capital exports to such nations.

H. J. Dernburg

New York, N.Y.

Business Administration

L'Organisation rationelle de la distribution (moyen de stabilisation économique). By Eric Bovet. (Neuchatel, Switzerland: Delachaux & Niestlé. 1954. Pp. 268.)

The author has two purposes: (1) an explanation of the ways in which current methods of distribution in industrialized countries operating under a "free enterprise" system create substantial economic instability and contribute to economic stagnation, and (2) a prescription of policies which will beneficially change methods of distribution.

Major evils of systems of distribution such as exist in the United States and France are, according to Bovet, a failure of changes in demand by ultimate consumers to be communicated promptly and accurately to manufacturers through the channels of distribution. This deficiency in our pricing mechanism creates substantial fluctuations in inventories at all levels in the channels of distribution with cumulative effects that tend to generate self-reinforcing upward or downward movements in the economy. The characteristics of our distributive system which create the malfunctioning of the pricing mechanism are the lack of a pervasive and relatively complete vertical integration and the practice of producing in anticipation of orders rather than to order. These characteristics of our distributive system have become increasingly important and detrimental as the technology and scale of manufacture have changed. In Bovet's view, distribution has not adapted itself to current methods of manufacturing.

There will probably be little disagreement with the view that inventory fluctuations have contributed significantly in recent times to economic instability, or even that instability and the uncertainty which it creates can be deterrents to economic growth. Nor will Bovet fail to find substantial support for his view that legal barriers to vertical integration such as have been created in this country by decisions such as the one handed down in the A & P case are not in the public interest.

It is much more difficult to see merit in the author's diagnosis of the ills of our economic system and especially in his prescriptions for their remedy. Bovet's major themes are that we should integrate vertically and produce to order rather than in anticipation. He admits, however, that vertical integration is often impracticable, as is also production to order. He provides no guides as to how far we should go in these directions, and thus we have no new principles by which entrepreneurs can order their behavior. There has never been much promise in any prescription which seemed to imply that businessmen should seek anything other than what they regard as the well-being of their enterprises.

Bovet does make one specific recommendation of a secondary nature which seems wrong rather than merely not helpful. He recommends that vertically

integrated firms price their products to ultimate consumers on the basis of incremental production costs at the first stage in the process of production rather than on the basis of the cost at the last stage as defined by internal transfer prices. If transfer prices are determined by free negotiation between the integrated units and in the presence of real alternative markets for both buyer and seller, the transfer price thus arrived at is a better (more profitable) guide to managerial pricing than is the current incremental production cost at some earlier stage in production. The use of transfer prices, so determined, seems to be increasing in American business. Even when the conditions just described do not exist, there seems no reason to have regard exclusively for incremental costs at the earliest stage in production as opposed to considering all costs of producing the ultimate market values that are demanded by consumers.

James H. Lorie

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Industrial Organization; Public Regulation of Business

The Attack on Big Business. By J. D. Glover (Boston: Division of Research, Graduate School of Business Administration, Harvard University. 1954. Pp. xvi, 375. $4.00.)

Big Enterprise in a Competitive System. By A. D. H. Kaplan (Washington: The Brookings Institution. 1954. Pp. xii, 269. $4.00.)

A renascent interest in big business has arisen from quarters holding disparate social points of view. Hence, it is not surprising that while Glover was in the process of preparing his thesis that nearly everybody is *against* big business, several books and a spate of articles appeared in its defense.[1] Unfortunately in a way for Professor Glover one such book, Mr. Kaplan's, is reviewed here with his.

Even the most ardent critic of bigness would probably concede during his moments of dispassionate reflection that the composite attack on big business can scarcely claim the support of impeccably coherent logic: big profits suggest monopoly, small profits inefficiency; high prices look like consumer plundering, low prices a tactic for driving out competition; expansion heads off new competition, failure to expand is output restriction. Some scholars attack big business as *monopolistic* but support big labor, big government, and cartelized agriculture; and some condemn big business price rigidities as noncompetitive but champion Fair Trade. Glover's book is essentially a catalog of all these attacks and many others.

But we may concede to Glover that big business has been attacked with irresponsibility and still not erase the problem of bigness. To a society that leaves the determination of the composition and level of a substantial share of its national product to the competitive pricing system, bigness in a market sense *is* a problem, and one that does not diminish—much less disappear—because critics of bigness have sometimes chicaned. Some of the attacks Glover

[1] For example, see D. Lilienthal, *Big Business, a New Era*, and J. K. Galbraith, "The Defense of Business: A Strategic Appraisal," *Harvard Bus. Rev.*, Jan.-Feb., 1954, XXXII, 37-43.

distains are valid, and some others are invalid not because of confusion of the attacker, but because they are not attacks on bigness. Glover fails to distinguish between attacks on bigness and attacks on a host of other things ranging from individualism (p. 232) to industrial society (p. 201) and urban life.

For this reason his final chapter of prescriptions for big business action holds little promise of quieting the criticism. No business action can simultaneously quiet criticisms from such a variety of sources as the Marxists, the apostles of atomization, the critics of business, the critics of individualism, Wayne Morse, T. S. Elliot, John P. Marquand, and George Bernard Shaw.

In contrast to these attackers, Mr. Kaplan has looked upon the structural aspects and performance of big business and found neither a cause for alarm. Big business has, on balance, simply kept pace with the rest of the economy: the largest 5 per cent of the manufacturing establishments hired 55.3 per cent of all manufacturing employees in 1914 and 62.3 per cent in 1947 (the slight increase Kaplan attributes to the second world war); the 100 largest industrial corporations held 24.6 per cent of all industrial assets in 1909 and 26.7 per cent in 1948; they earned 31.1 per cent of all industrial corporate profits before taxes in 1909 and 30.1 per cent in 1948; and between 1929 and 1948 their percentage of all industrial corporate profits after taxes declined from 44.03 per cent to 29.85 per cent. The number of firms is growing more rapidly than total population; noncorporate enterprises still account for almost as large a percentage of the national income as in 1929; and over 70 per cent of the gainfully employed are found in the smaller business units or in the nonbusiness field. In short, the giants have not taken over the country and there is no evidence that they are doing so.

Moreover, big business has performed well and exists in a constant state of competitive turmoil. Kaplan's principal criticism of big business on this score is that it has not matched its brilliance of innovational change with "commensurate ingenuity and boldness in sloughing off parts that no longer gain in efficiency by being integrated with the giant enterprise" (p. 227). But Kaplan concludes: "Big business has not merely been kept effectively subject to a competitive system; on the whole it has also made an essential contribution to its scope, vitality, and effectiveness" (p. 248).

On many of these subjective conclusions Kaplan may be right. However, to this reviewer, his conclusion on the fluidity in the upper echelons of big business rests on unconvincing evidence. Kaplan infers dynamic competition from the high turnover among the largest 100 industrial firms. He divides the 100 largest firms into 21 broad industry classifications, and notes that of the 100 comprising the 1909 list only 36 appear on the 1948 list, and that within each of the 21 industries considerable interchanges and turnovers in positions have occurred. Except by footnote references, he fails to point out that 6 of the original 100 disappeared via the merger route, and that 6 of the largest 100 on the 1948 list resulted from the dissolution of American Tobacco and Standard Oil. However, we may excuse these omissions from his computations on the grounds that the results are neither materially affected nor indicative of competition anyway. It should come as a surprise to no one that between

1909 and 1948 steamship, express, sugar refining, locomotive, and ice companies gave way to producers of automobiles, aircraft, motion pictures, electrical appliances, and rubber tires.

Because Kaplan has used such broad industry classifications we would expect, for the same reason, to find considerable firm turnover and disparate rates of growth during this period within each of the 21 industries. For example, transportation equipment includes producers of farm machinery, pullman cars, locomotives and parts, steamships, automobiles, and aircraft. Within this industry group in the course of 40 years American Locomotive, Baldwin Locomotive, Pressed Steel Car, Railway Steel Spring and American Shipbuilding disappeared from the 100 largest and were replaced by General Motors, Ford, Chrysler, and Curtis-Wright. The fluidity at the top is clearly a result of too broad industry classifications.

The reviewer, with no intention of turning a book review into a major research project, rearranged the firm ranks in accordance with somewhat narrower industry definitions and constructed the following table:

Firm and Industry Classification	*Rank*	
Iron and Steel	*1909*	*1948*
U. S. Steel	1	1
Colorado Fuel and Iron	2	–
Lackawanna Steel	3	–[a]
Republic	4	3
Bethlehem	5	2
Copper		
Amalgamated (Anaconda)	1	1
American Smelting and Refining	2	3
Kennecott	–	2
Nickel		
International	1	1
Meat Packing		
Armour	1	2
Swift	2	1
Cudahy	3	3
Dairy Products		
Borden	1	2
National Dairy	–	1
Transportation Equipment/Excluding Autos and Aircraft		
International Harvester	1	1
Pullman	2	2
American Car and Foundry	3	3
Petroleum		
Standard Oil (Standard of N.J.)	1[b]	1
Standard of Indiana	–[b]	2
Socony-Vacuum	–[b]	3
Standard of California	–[b]	4
Chemicals		
Du Pont	1	1

Firm and Industry Classification	*Rank* 1909	1948
Coal Mining		
Pittsburgh Coal	1	1
Consolidated Coal	2	—[c]
Tobacco		
American Tobacco	1	1
R. J. Reynolds	—[d]	2
Liggett & Myers	—[d]	3
Electrical Equipment and Machinery		
General Electric	1	1
Westinghouse	2	3
Western Electric	3	2
Rubber		
U. S. Rubber	1	2
Goodyear	–	1
Lumber and Paper		
International Paper	1	1
Containers		
American Can	1	1
Retail Distribution		
Sears-Roebuck	1	1
Glass		
Pittsburgh Plate	1	1
Miscellaneous		
United Fruit	1	1

(a) Merged with Bethlehem in 1922
(b) Created by dissolution of Standard Oil in 1911
(c) Merged with Pittsburgh Coal in 1945
(d) Created by dissolution of American Tobacco in 1911.

These rankings scarcely support Kaplan's conclusion that firms are constantly in danger of losing their foothold in their respective industries through the forces of dynamic competition. With but few exceptions the leaders of particular industries in 1909 and 1948 were the same firms. The interchanges in ranks in iron and steel are due almost entirely to merger, and the newcomers in petroleum and tobacco we owe to the Department of Justice. Neither large-scale merger nor dissolution is an integral part of dynamic autonomous change.

In spite of the dubious support his own data give to his principal thesis, however, Kaplan's book contains much useful information and says a great deal that makes sense. And if its readers should conclude that Kaplan has been less critical of big business than he should, they may quickly turn to Glover for a comprehensive footnote on how vigorously and viciously big business can be attacked. The reader's emotions toward big business may possibly undergo violent cyclical swings as he moves between the two books, but they will very probably come to rest in the approximate neighborhood of where they started.

JESSE W. MARKHAM

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Fair Competition: The Law and Economics of Antitrust Policy. By JOEL B. DIRLAM and ALFRED E. KAHN. (Ithaca: Cornell University Press. Pp. xi, 307. $4.50.)

In recent years the antitrust laws have come in for increasing criticism. Some critics have charged that the laws now restrict businessmen so much that they discourage the vigorous competition they were designed to protect. Others have asserted that the sort of competition the law attempts to establish is either unobtainable or, in view of the fine performance of an imperfectly competitive American economy, actually undesirable.

In this book Professor Dirlam and Kahn attempt to defend antitrust law against its critics. After summarizing court decisions of the last fifteen years, they conclude that the Sherman and Clayton Acts have not deviated from their historic and proper path. They admit there have been some changes—chiefly with respect to price discrimination—but they are not as great as critics have claimed.

To Dirlam and Kahn the law has not only remained essentially unchanged, but is appropriate and effective as well. Indeed, they say, the law furnishes better standards for judging business forms and practices than does economics. Much of this alleged superiority rests upon the use of "intent" to judge legality. In their judgment, legal criteria are superior both because morality may demand that some actions be proscribed irrespective of their economic effects, and because economists have not supplied useful alternative standards. As is sometimes true of fervent declarations of faith, however, confidence in "intent" is not nearly complete. For, as they put it, intent must be accompanied "by the power (actual or imminent) to restrain or exclude . . ." (p. 54). They classify court decisions according to the types of practices with which they deal: vertical integration, monopolizing, exclusive arrangements, tied-in sales, and price discrimination. I shall confine my comments to the discussions of vertical integration and price discrimination.

With respect to vertical integration, the authors make two key claims, neither of which they systematically prove or explain. First, among other things, vertical integration enables a firm with some monopoly power at one level to *increase* its monopoly power at another. Second, integration forces monopoly misallocations from one level into the others in some way that vertical disintegration would remedy. Both of these assertions are incorrect, as the literature amply demonstrates.[1] In support of the first proposition the authors offer the slender defense that businessmen may not actually try to maximize profits. With an effective economic hypothesis thus abandoned without replacement, it is not surprising that analysis and policy recommendations suffer.

Their economics is unorthodox and mysterious in still other ways. At one point, for example, they are led into what seems to be an attack on the ra-

[1] See, for example, J. J. Spengler, "Vertical Integration and Antitrust Policy," *Jour. Pol. Econ.*, Aug. 1950, LVIII, 347; M. A. Adelman, "Integration and Antitrust Policy," *Harvard Law Rev.*, Nov. 1949, LXIII, 27; R. Bork, "Vertical Integration and the Sherman Act: The Legal History of an Economic Misconception," *Univ. Chicago Law Rev.*, Autumn 1954, XXII, 157; "Comment: Vertical Forestalling under the Antitrust Laws," *Univ. Chicago Law Rev.*, Spring 1952, XIX, 583.

tionale of market pricing. In their words, "Government intervention outside the antitrust laws is probably the only way of assuring fairness in the distribution of scarce materials" (p. 159). If they are correct, it is a discovery worth explaining in detail. Unfortunately, however, they develop neither the details of this deficiency of a pricing system nor the working of their remedy for it.

The discussion of price discrimination suffers in much the same way. In addition to reviewing the standard criticisms of the practice, the authors make the dubious argument that discrimination is bad because it may involve "recoupment." This argument asserts that when a seller discriminates in price, the "lower price to one buyer ordinarily means the price to other buyers will be raised correspondingly" (p. 208). This notion rests upon the explicit assumption that sellers do not seek to maximize profits. Since that hypothesis is consistent with virtually any kind of behavior, it is often unclear why the authors approve or disapprove of a particular court decision or business practice.

After analyzing the cases, Dirlam and Kahn conclude that the antitrust laws have not seriously interfered with efficiency. Not only have the antitrust laws not gone too far; in the case of concentrated industries, "the solution . . . would be to break up excessively concentrated market structures" (p. 281). It is anomalous that the authors find themselves capable of making the same sorts of economic judgments that they find economists generally incompetent to make.

They do find the Robinson-Patman Act to be too confining, and, in a general way, advocate loosening its restrictions somewhat. They apparently advocate this on economic grounds, but at the same time warn that "considerations of equity cannot be abolished in the name of effective competition" (p. 277). Just where this leaves the matter is not absolutely clear.

This book thus has serious defects. Although they profess little confidence in economics, the authors deal with problems that require it, and indeed sometimes advocate its use. Unfortunately the economic analysis they do adopt is weak; there are errors here that betray an inadequate understanding of the economic tools the authors condemn. One example is their contention that the theory of pure competition is inapplicable even when numbers are "infinite" (p. 233).

In addition to technical errors and irrelevancies, there is much here to confound anyone interested in scientific methodology. Terms like "dominance," "strategic superiority," and "leverage," though used often, are not explained. Furthermore, the authors sometimes end up evaluating different variables from those whose analysis they promise.

Although this book recognizes a fascinating and important problem, its approach falls between chairs. It might systematically have defended the law on purely moral, ethical, or other noneconomic grounds. It might, alternatively, have analyzed the law purely in terms of economic principles, or by the systematic use of both economic and noneconomic standards. One major defect of this volume is that it mixes, in unspecified proportions, vague moral values and unsystematic economics.

The book is not without merit. Probably most useful are the summaries

of recent cases and discussions of the ideas of many writers in the field. The substantial bibliography and table of cases are also helpful. More important, we may predict that this volume will add new interest to the stimulating controversy of which it has now become a part.

JOHN S. MCGEE

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Die Neuordnung der Eisen- u. Stahlindustrie im Gebiet der Bundesrepublik Deutschland ein Bericht der Stahltreuhaendervereinigung. (Münich and Berlin: C. H. Beck. 1954. Pp. xxii, 872. DM. 48.)

This report of the German subgroup operating as the executive arm of the allied control of the German steel industry, between 1949 and 1952, gives an account of its stewardship, which ended with the coming into operation of the Schumann Plan. Together with a description of the (coal and) steel industry, it gives a detailed account of the motives, problems, development, and results of the Allied policy concerning the West German steel industry. Among other things, very interesting insights into a pattern of "workable" imperfect competition emerge. Currently, the technological dynamics in the steel-using industries seem largely to influence the rational pattern for structure and business procedure in the steel-making industry.

The reporting group, with the approval of the allied authorities, did not function merely as a passive subordinate organ of Allied policy but took an active part in the planning and acted as the guardian of justifiable German interest.

The views and actions of the Allied authorities, of the German combines and the trade unions as well as the views of corporation lawyers and experts in international law and of German economic and technical experts are presented if not in the text, then in the annexes which cover about half of the volume. Allied ordinances and decisions concerning the reorganization and the exchanges about this between the industry, the controlling authorities, the German government, the trade unions, etc., are reproduced. A detailed account of the structure of the combines before and after the reorganization is given as well as a description of the pattern of the so-called codetermination between management and labor.

In assessing the merits and demerits of the organization and policy of the industry itself and of the success or otherwise of the Allied reform effort, it must be remembered that the industry had to meet frequent radical changes in environment, and that the goal of Allied policy has shifted from the main emphasis on disarmament and dismantling to one of deconcentration and decartelization and finally to one of reconstruction of an efficient, highly competitive industry and ultimately even to partial restoration of armament production capacities. Finally, the industry, together with the closely united German coal-mining industry, entered into the Western European coal and steel union in the fold of the European Payments Union and the Organization for European Economic Cooperation. This marks the beginning of the end of allied control.

A full appraisal of the industry's performance and of the Allied effort to

improve on it is impossible in the space here available. This reviewer was left with the impression that while the breakup of overly large combines, especially in the case of the German United Steel Works with its 177 subgroups, was called for in the interest of more initiative and flexibility of management, the originally planned horizontal breakup frequently overshot the mark of what was sound in terms of efficient production and marketing. The full separation of the steel works from the vertically integrated coal mines and from the affiliated steel-processing combines (shipyards, construction works, wire and tube industries, etc.) if carried out as planned, would have vastly reduced the competitive capacity of the industry by comparison with its horizontally as well as vertically highly integrated European and American rivals. Also there were inconsistencies in objectives. In view of the rapidly changing general conditions under which the industry operates, the planned schemes for plant structure seem too final and too much oriented to the conditions of a closed German economy, while on the other hand the final financial reorganization is left to the decision of a future independent German government. The only partially accomplished breaking up of vertical and horizontal combines in some instances left truncated bodies which in order to regain efficiency, would have to be reintegrated with others, which is against the purpose of Allied policy, or would have to be supplemented by new installations, which would mean misinvestment of very scarce capital.

In fact, with the end of effective Allied control a movement of reconcentration has already set in. The prewar formal cartels, however, have not made their reappearance.

HERBERT VON BECKERATH

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Competition and its Regulation. By A. G. PAPANDREOU and J. T. WHEELER. (New York: Prentice-Hall. 1954. Pp. vii, 504. $6.50.)

Professors Papandreou and Wheeler have innovated with considerable success in their new textbook, designed primarily for undergraduate courses in public control of business. Their innovations consist of the presentation of certain conceptual developments of recent years heretofore confined to more advanced and specialized works or to the journals, and a somewhat novel organizational structure in presenting the material. The volume is divided into two parts, the first presenting the analytical tools deemed useful by the authors for understanding the regulation of competition; the second presenting a picture of the development of antitrust policy primarily as evidenced in the important decisions of the courts.

In the theoretical portion of their book Papendreou and Wheeler begin with the concept of the market group, defined in terms of cross-demand and cross-sale schedules. (The cross-sales schedule is that portion of the cross-demand schedule which includes those prices that the rival can make "effective" in the market, *i.e.*, where he has sufficient capacity to make a lower price stick by supplying the increased quantity demanded.) The market group concept and the industry concept (defined on the usual basis of technology and product similarity) are combined to produce the basis for delineating the various

market/industry subgroups which are distinguished in the subsequent analysis. This is followed by an analysis of the crucial decisions of the firm including those as to price, output, product mix, selling effort, investment and price discrimination. The authors rely exclusively on the "break-even chart," and make no use of the traditional marginal analysis.

The innovation which will probably attract most attention for this volume is its presentation of firm behavior in "circular" (oligopolistic) markets in the framework of the theory of games. Lest some potential users of this volume be frightened by this, it should be emphasized that only the simplest and most rudimentary skeleton of game theory appears and no mathematical material is even mentioned. The authors' use of game theory is nothing more than a convenient and helpful way of looking at the various forms of behavior which may appear in oligopolistic markets.

The chapters in the first part, which in addition to the subjects already mentioned discuss buyer-seller relations, entry, and selling outlay and product type in circular subgroups, are designed not only to develop concepts which can be used in analyzing particular cases, but also to serve as the basis for consideration of "Criteria for Public Policy." This serves as the bridge between the two parts of the book and indicates the standards by which antitrust policy is to be evaluated in the second part. The criteria presented are the authors' own variant of "workable competition." With others who identify their views by this term they are unable to come up with a very precise set of rules and they are at pains to confess the unsatisfactory status of their criteria.

Papandreou and Wheeler argue that the public authority should aim at preservation of freedom of competition or "potential competitive pressure" and that to do so the attempt must be made to assure that (1) entrance is free, (2) no firm is coerced to withdraw from the market, and (3) firms do not fix the outcome of the "game" through cooperative action. They then rate the major types and subtypes of market group behavior (independence pattern, cooperative pattern, restrictive pattern, interference pattern) which their analysis has delineated. They recognize the extreme difficulties which such a general prescription faces in applying it to such problems as firm size, vertical integration, dissolution, etc.

The second part of the book is organized along familiar lines under such headings as horizontal coalition, aggressive behavior, firm size, monopoly, fusion (merger), unfair competition, various types of price discrimination, and resale price maintenance. Under each of these headings the historical development of the law is presented with frequent reference to the important cases and extensive quotation from the opinions of the courts. The volume ends with a chapter on enforcement.

It is impossible in the scope of a review to mention all of the points at which the reviewer would like to give a special word of commendation or voice a word of objection or disagreement. In the first category, I would like to compliment the authors' selection of cases and quotations from cases. They have resisted the temptation to reproduce a legal case book and have kept the size of this part of the work surprisingly small, yet they have been able to cover most of the points significant for the economist in evaluating trade regu-

lation. This reviewer has found also that the game concepts are pedagogically useful in helping students understand the nature of what we call "the oligopoly problem." The classification of market and behavior types is also on the whole very satisfactory. Almost everyone teaching in this field has his own particular viewpoint. This book is so organized, and in particular the cases so well selected, that there is ample opportunity for interpretation and evaluation different from the authors'.

On the other side of the ledger, I would question the wisdom of eliminating marginal theory completely, since the break-even analysis proves particularly cumbersome when dealing with some problems such as price discrimination. One's taste here will depend on the training of the students. If most of the students have only a principles course behind them, and particularly where the principles course devotes little time to price theory, then Papandreou and Wheeler's approach may be an asset.

Since the game theory concepts are useful, it seems unfortunate that the authors did not push them just a bit further. One of the most useful parts of game theory for oligopoly analysis appears to be its suggestions as to the rules for coalition formation. While it is probably necessary to introduce the concept of the mixed strategy to deal adequately with this topic, the authors have demonstrated sufficient expositional skill to make one wish they had been more ambitious. Perhaps they will at least include an appendix on this subject in later editions.

A final word regarding the use of this book: it is short enough so that in a semester course other materials can be assigned and discussed. This reviewer has found a desirable complement in one of the industry study books. Papandreou and Wheeler present no empirical material illustrating their analysis except for the snatches of descriptive material included in some of the court opinions quoted. Another possible supplement to this book, and one some teachers will find desirable, is one or more sources which discuss the noncompetitive sectors of the economy where regulatory commissions are relied on instead of the competitive market. The absence of any discussion of other than the competitive sector of our economy will be regarded by some as an unfortunate omission.

In textbooks the proof is in the teaching: I have used Papandreou and Wheeler once and I would use it again. In addition to its usefulness as a textbook it provides a clear and relatively accessible expression of the viewpoint shared by many economists towards the problems discussed and as such may appeal to nonspecialist economists and interested laymen and lawyers.

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Land Economics; Agricultural Economics; Economic Geography

Agricultural Policy: Farm Programs and National Welfare. By Rainer Schickele. (New York: McGraw Hill. 1954. Pp. x, 453. $6.50.)

This book is a very comprehensive presentation of the U.S. farm problem. In contrast to other discussions of this topic in which goals of economic policy

are not formulated with full clarity, Schickele offers a thorough discussion of these goals. He postulates "maximum social product" and "optimum income distribution" as basic norms. A number of readers may not object to the norms per se, but to the rather involved way in which they are developed.

Government programs are grouped into, (1) programs for improving resource allocation, (2) farm price policy, and (3) programs for improving income distribution. In the light of the goals of agricultural policy as set up by the author all three groups deserve the painstaking consideration given to their evaluation: the greatest interest, though, centers around the author's analysis of farm price policies.

Among the programs for improving resource allocation the author discusses soil conservation in great detail and shows that a number of conservation measures did not achieve the desired result of improving conservation practices. Conservation payments were frequently made for practices on land which did not require special conservation techniques. The author points out that the public is entitled to clear-cut accounting of costs and accomplishments of various practices; but at the same time he is aware of the administrative difficulties of controls. It would appear that the educational work and the stimulation to individual action are probably the most effective part of the U.S. conservation program.

The author's discussion of farm price policies will arouse objections from all sides. Opponents of support prices for special commodities have shown convincingly that these measures neither promote better income distribution, nor improve resource allocation. Schickele admits that support prices of special commodities have their shortcomings, but he explains their dominant role in all farm programs by their immediate effect on farm incomes: "Farmers look at farm prices much the way industrial workers look at wages." Schickele recommends support prices for wheat, cotton, corn and citrus fruit, pointing out that these commodities are subject to particularly great price fluctuations and play a decisive role in the economic life of wide areas. In addition to price supports for the above mentioned crops, Schickele favors forward prices and production goals for a large number of farm products for which production adjustments can be achieved by shifting variable factors.

The author is well aware of the unsatisfactory effect of the existing support system on income distribution. He therefore suggests a number of measures to alleviate poverty on submarginal farms, and to improve economic prospects of middle-sized farms. He is especially concerned with improving credit facilities, with crop insurance, and with variable debt payment. He analyzes programs to safeguard farmers' ownership of land, and encouragement of farm cooperatives.

While the author's recommendations for raising income standards in general will be accepted by most students of the U.S. farm program, it seems obvious that Schickele is inclined to underrate the effect of the support-price system on the U.S. economy. High support prices are responsible for the accumulation of enormous surpluses in the hands of the government (about $4.2 billion of surplus goods owned by the Commodity Credit Corporation plus $2.9 billion of outstanding loans at the end of 1954). Wheat prices are supported at levels

which cover costs of production on submarginal land and far above costs of low-cost producers in the fertile wheat areas of our country. The high level of these prices has encouraged increased production of wheat all over the world. The disposal of U.S. surpluses on domestic and foreign markets poses one of the most perplexing problems of our economic policy.

MARTHA STEFFY BROWNE

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Labor

The Theory of Collective Bargaining: A History, Analysis and Criticism of the Principal Theories Which Have Sought to Explain the Effects of Trade Unions and Employers' Associations Upon the Distribution of the Product of Industry. By W. H. HUTT. (Glencoe, Illinois: The Free Press. 1954. Pp. 150. $3.00.)

At a time when the issues of imperfect markets and countervailing power are being widely debated, the reprinting of this book, originally published in 1930, will be of interest to economists. For despite a wealth of recent institutional interpretations of unionism, the *economic* claims of collective bargaining have not received much theoretical attention since the period of active discussion that extends from Thornton in the 'sixties to the Webbs in the late 'nineties of the nineteenth century. So far as the economics of the issues are concerned, we have had a mélange of partial cases and attacks on marginalism, whose collective burden has been to show that unions can raise wages without decreasing employment, but which have not explored the implications for the whole economy. One might even say that of late labor economists have become so preoccupied with the terms of trade under collective bargaining that they have forgotten the whole question of the gains of trade from specialization and division of labor.

Professor Hutt has tried to remedy this situation. He holds that the economic case for collective bargaining reduces to two contentions: (1) if no collective bargaining, the workers' market disadvantage would enable the owners of other productive agencies to appropriate income that would otherwise go to labor; and (2) with collective bargaining workers *in general* can appropriate income from the owners of other agents. Hutt rejects both contentions.

The idea of labor's market disadvantage, he argues, stems from Adam Smith, who tied it to his subsistence theory. First, Smith held that masters combined to force wages down, for which there is little evidence. Second, Smith said that masters also combined to keep wages low, which Hutt says merely means that employers then believed in a "natural rate" and were reluctant to raise wages, though Smith himself made the exception that wages would rise under competitive pressure whenever the rate of saving (reserves) outran the rate of population growth.

Third, Smith claimed that the masters' "necessities" were less pressing than those of the workers. Somewhat contradictorily relative to his exception just noted above, Smith based this notion on the difference in relative reserves.

Thornton and others amplified and further confused this idea, referring vaguely to "inequality of bargaining power," inability to monopolize the sale of labor power, or the perishability of labor services. Yet perishability is equally true of much capital (Nicholson), while storability of labor power might at times actually prove a handicap (N. G. Pierson).

In the 'sixties there also emerged the idea of the indeterminateness of the wage bargain: Thornton and Mill suggested that if two parties bargain in isolation, there may be no unique market-clearing price. Edgeworth developed this idea with his superimposed indifference maps of 1881, but later discounted its practical importance.

Jevons took a somewhat different view of indeterminancy, basing it upon the exchange of a unique and indivisible good sold in perpetuity by a monopolist. Although he did not relate the case to the labor market in his work of 1871, in his *State in Relation to Labour* (1882) he treated combination bargaining as involving a "single object" (indivisable unit), and declared that supply and demand analysis was not applicable. As Hutt says, however, labor quantity would still be a variable, even if the wage were indeterminate. This objection stands unless one presumes Fellner's "all-or-nothing" case, where the wage and quantity of employment are jointly bargained for.

Hutt admits that particular unions can raise wages—for small segments of the wage-earning population but not for *all* labor. One method is to exclude competing units of labor and indirectly some of the cooperants, and if possible to prevent the excluded factors together from re-entering the trade. Another involves the rare case of inelastic labor demand, where consumers and owners of immobile cooperant factors are both exploited. However, the immobility of capital is not permanent: its long-run supply is highly elastic because new capital will avoid a badly squeezed trade and old investments will be liquidated. Further, whatever the method of forcing up wages, the decreased scale of the industry will in time also be accompanied by substitutions of capital for labor.

Hutt also denies that labor in general is immobile and so could be exploited by capital as a whole. Monopsony is at most a specialized and temporary situation and will be overcome by entry of new firms seeking the added profits of temporarily depressed wages.

The argument yields two general conclusions. One is that workers as a whole do not suffer any inherent bargaining disadvantage that, in the absence of collective bargaining, would force wages below competitive levels and presumably towards "subsistence," transferring income to owners of other factors. The other is that collective bargaining cannot extract income from these other factors, converting it to wages for the benefit of labor as a whole. Partial wage gains are not taken ultimately from profits or interest but from consumers, who will pay higher prices for eventually decreased outputs in the affected trades. Since the consumers who lose are mainly wage-earners themselves, what collective bargaining at most can do is to redistribute income within the working class itself. So Hutt concludes that the economic claims of collective bargaining do not stand up. Its justification lies in other directions: regulating hours, conditions, and personnel actions—a domain where the discipline of the market is ineffective.

One possible criticism of the argument is that it probably overrates the mobility of labor. Recent empirical studies would so suggest, though they tend to overstress the range and severity of monopsony.

There is also a question of fact: whether unions in general in this country have had the power and have actually exerted the drastic cost pressure usually attributed to them. This reviewer suspects the over-all answer is negative, that unions pay more attention to demand conditions than is usually credited to them. The whole question has been obscured by too much emphasis upon supposedly inflexible "patterns" generated by and limited to periods of inflation (1941-48, 1950-53) and by the special case of the United Mine Workers.

The author's framework is Marshallian and passes over complex questions of wages and employment during major business fluctuations. The gap is serious, though extenuated because the book was written in 1930. Moreover, while cyclical swings pose new questions outside the neoclassical framework, they do not destroy the useful predictions yielded by the analysis for the important problems with which it is properly concerned. If anything, Hutt might have extended his treatment to consider the connections between capital formation, innovation, population growth, and real wages, matters that tend to be overlooked in our current preoccupation with short-run cases.

While there are many important aspects of unionism that lie outside the domain of economic analysis, this book is a useful and needed reminder that collective bargaining carries economic implications after all. Thus its appearance is most timely.

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Labor Mobility and Economic Opportunity. (New York: John Wiley and Sons. 1954. Pp. viii, 118. $3.50.)

There has been some tendency in the past to regard the economics of labor as coincident with the economics of wages. It is gradually becoming clear, however, that the subject includes a second major area—the dynamics of the labor force, the processes of labor mobility, and the structure of labor markets. Pioneer research on these matters was initiated at several American universities during the nineteen thirties. Since 1945, it has flourished on an expanded scale at Pennsylvania, Massachusetts Institute of Technology, Yale, Cornell, Minnesota, California, and a number of other centers. The movement has spread abroad, and one hears of labor mobility studies in London, Stockholm, Rotterdam, Marseilles.

The present volume, sponsored by the Labor Market Research Committee of the Social Science Research Council, marks a stage of consolidation in this general movement. It consists of a series of related essays by E. Wight Bakke, Philip M. Hauser, Clark Kerr, Charles A. Myers, Gladys L. Palmer, and Dale Yoder. Taken together, these essays provide a good review of accomplishments to date and of unresolved issues in the rapidly expanding area of labor market research.

It is not possible in a brief review to give each essay the attention it really deserves. Philip Hauser's chapter on "Mobility in Labor Force Participation"

provides the best summary available anywhere of what we know and do not know about secular, cyclical, and other types of shift in the United States labor force. It includes also a review of wartime changes, and some discussion of labor force projections from the present to 1975. The chapter is rich in statistical information and in footnote references to other sources. The author's appraisal of previous work is penetrating, fair, and candid in pointing out areas of ignorance and unresolved issues.

Clark Kerr, in a brilliantly written essay on "The Balkanization of Labor Markets," indicates some of the ways in which the "natural" or "free" labor market is being altered by the development of institutional rules, particularly rules arising from trade unionism and collective bargaining. He develops the interesting thesis that craft and industrial unionism lead to quite different patterns of labor mobility—in the craft case, horizontal movement at the same occupational level among a variety of employers, and in the industrial case strong attachment to a single employer but with the possibility of vertical movement to better jobs within the firm. These two patterns he terms respectively the "guild" and "manorial" principles of labor market organization. This is only one of several stimulating hypotheses which Kerr propounds as a spur to future research activity.

The core of the book, in a sense, consists of three essays by Charles Myers, Gladys Palmer, and Dale Yoder, which report findings from the authors' studies of mobility within local labor markets. Any student who wishes a bird's-eye view of the present state of knowledge on this subject could not do better than to begin with these chapters. The scholars who have been working on labor mobility in various parts of the country, among whom this reviewer is happy to be included, have made an unusual effort to keep in close touch as their work has proceeded and to achieve some comparability of hypotheses and research techniques. The SSRC Committee, the annual conferences at the University of Minnesota, and a number of other institutional devices have contributed to this end. In consequence, recent research on labor mobility has been "additive" to a degree which is rather unusual in social science. As one examines these three chapters, one finds an encouraging number of conclusions which have been confirmed in several studies carried out at different times and places.

One also finds some interesting conflicts in the evidence, or at any rate in the interpretation of the evidence by different scholars. Thus Myers writes: ". . . both studies point to the fact, also found by Reynolds and Shister, that there is very little systematic search for jobs by workers, or weighing of job alternatives" (p. 76). Miss Palmer, on the other hand, comments: "One gains the impression from a review of the Philadelphia work history records that the workers concerned had a considerable knowledge of labor market conditions and pursued their occupational careers in a purposeful fashion. . . ." (p. 62). This paradox, as both authors realize, may turn out to be more apparent than real. The groups of workers studied were rather different in the various cities, and the Palmer studies emphasized work experience over a decade or more rather than individual job shifts. It may be, as Palmer suggests, ". . . that career framework considerations outweigh accidental circumstances if one looks at the record of jobs *over time*, as distinct from a cross-section view of a number

of single job transactions in a local market at any given time" (p. 66). This is only one of many interesting problems which remain to be cleared up by future work.

An introductory essay by Wight Bakke and a concluding note by Gladys Palmer stress the economic and social implications of labor mobility and pose a series of challenging questions. Thus Bakke inquires "... can we undergird the economic and social strength of our nation by adequately and efficiently distributing our labor resources, without destroying, for ... workers and employers, the free choice and free movement which ... have encouraged them to loyalty to the American system?" (p. 7). Palmer expresses an opinion that "in a free labor market the costs of 'too much' mobility can be more readily absorbed than the costs of 'too little' mobility" (p. 112), and supports this by some discussion of the limited mobility in European labor markets. There is clearly a range of issues here to which economic theorists have not yet given adequate attention. What precise meaning(s) should be given to the term "mobility" for purposes of general reasoning? How much mobility, and what kind of mobility, is desirable? What does one mean by "too much" or "too little" mobility? What institutional arrangements in the labor market will be conducive to the amount and kind of mobility we want?

A reviewer must stick to his volume. It is pertinent to note, however, that this book appears almost simultaneously with two others: Gladys Palmer, *Labor Mobility in Six Cities*, and Herbert Parnes, *Research on Labor Mobility*. These volumes, both sponsored and published by the Social Science Research Council, should be regarded as companion pieces to the present work. The three together give one a heady feeling that labor economics is coming of age and that it will in time compare favorably, in point of generality and precision, with the more venerable branches of economic science.

Lloyd G. Reynolds

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Labor Mobility in Six Cities. A Report on the Survey of Patterns and Factors in Labor Mobility, 1940-1950. By Gladys L. Palmer, with the assistance of Carol P. Brainerd. (New York: Social Science Research Council. 1954. Pp. xiv, 177. $2.75; paper, $2.25.)

This volume summarizes the findings of the labor mobility project undertaken by the relevant research centers of seven universities[1] in cooperation with the Committee on Labor Market Research of the Social Science Research Council. The raw data analyzed by these centers were composed of ten-year work histories collected in January and February 1951 by the United States Bureau of the Census from workers in sample households in six cities: Chicago, Los Angeles, New Haven, Philadelphia, St. Paul, and San Francisco.

As might be expected, this project has yielded a wealth of statistical information on what are now fairly standard inquiries in labor mobility research—the volume of movement, the contrasts between mobile and immobile workers in

[1] University of California at Berkeley, University of California at Los Angeles, University of Chicago, Massachusetts Institute of Technology, University of Minnesota, University of Pennsylvania, and Yale University.

terms of age, sex, etc., the industrial and occupational direction of the movement, and so on. But for the first time such information is available in a form which lends itself to useful comparative analysis. Hitherto it has been very difficult (if not impossible) to compare the findings of labor mobility studies made by individual scholars either because the studies covered different periods or used different research techniques, or both. But for all practical purposes those obstacles have been removed in this project. It should be noted, however, that the project findings do not lend themselves to any "universal" generalizations because of the limited number of cities involved—not to mention other considerations.

In many respects the patterns of mobility are remarkably similar in the markets studied. Thus, "differences in the incidence of mobility among different groups of workers and the kinds of job shifts made follow a similar pattern in different cities, regardless of whether a city's degree of mobility is relatively high or low. Mobile workers differ from immobile workers in the same ways in Los Angeles and San Francisco, which have the highest job mobility, as in New Haven and Philadelphia, which have the lowest." But, as the preceding quotation indicates, there are differences between the cities in the volume of mobility, which are attributable mainly to "the relative importance of migrants in the city populations." And it is interesting to know that "differences in the industrial structure of the economies of the cities . . . do not account for any appreciable differences in mobility."

To say that the findings of this research project are indispensable for any future labor market study is to spell out the obvious. But indispensable as they are, these findings are only a beginning. For they are essentially aggregative statistical data which merely offer us clues in our search for the more fundamental determinants of labor mobility; clues which are necessary, but hardly sufficient, for an integrated understanding of mobility. This is not to imply that these data cannot be used directly for many a practical policy problem; they clearly can. But the scholar must have more. He cannot be satisfied with merely knowing that younger workers are more mobile than older ones, or that the unskilled move more frequently than the skilled, and so on. He must know *why* that is so—and for reasons far more compelling than the satisfaction of idle intellectual curiosity; there are long-run pragmatic considerations involved. Moreover, important mobility differences between individual workers in the same socio-economic group have to be explained adequately; and here the "group approach," even at the analytic level, is insufficient, for we must perforce dig into personality determinants.[2]

This study has relatively little to say about vertical occupational mobility, since the basic data are far too skimpy in that regard. And yet there is a crying need for a thorough exploration of such mobility, granted that it is the cornerstone of stratification theory which, in turn, is crucial for constructive policy decisions of either the private or public variety.

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[2] *Cf.* S. M. Small, "Unconscious Determinants of Vocational Choice," *New York State Jour. Medicine*, vol. 53, no. 20.

Research On Labor Mobility: An Appraisal of Research Findings in the United States. By HERBERT S. PARNES. (New York: Social Science Research Council. 1954. Pp. xi, 205. $1.75.)

With this publication the Labor Market Research Committee of the Social Science Research Council brings to a temporary close the program for stimulating research in the area of labor mobility which it started in 1946. During the past year, the Council has published, in addition, the findings of the largest empirical study of labor mobility in the United States to date, *Labor Mobility in Six Cities*, and has sponsored a small volume of interpretive essays, *Labor Mobility and Economic Opportunity* (New York, 1954), written by members of the Labor Market Research Committee and reflecting the mature thoughts of this group on the implications of mobility research for present-day society. The three publications together represent a substantial contribution to students and practitioners in this important field.

Within its limits, and as long as it adheres to its limits, Parnes' volume is a first-rate production. With the general advice of the Labor Market Research Committee, the author analyzed the significant American studies of labor mobility conducted by labor economists since the early 1930's. From these studies Parnes attempted (1) to ascertain the basic concepts, definitions, hypotheses, and methods used and the theoretical and methodological problems encountered, (2) to summarize and appraise the findings of these studies as to the extent, character, and determinants of labor mobility, (3) to relate the empirical results to some of the assumptions and conclusions of economic theory on the process of labor allocation, and (4) to suggest areas for fruitful further research. These four objectives have been accomplished in a thoughtful and skillful fashion. The author has not simply taken the research studies at their face value, but has assessed their weaknesses as well as their contributions with a critical eye.

The major limitations of the volume arise partly from the limits deliberately imposed by the author on the scope of his undertaking and partly from the scarcity of empirical work in important segments of the field. The scope of the volume was limited "to labor mobility only in relation to flexibility of the labor supply," and within this area primarily to short-run economic and demographic factors. The labor-demand side is treated briefly and inadequately as a determinant factor. This delimitation of the scope of the field is serious because it has resulted in the neglect of a number of important studies which focus on sociological, psychological, and political considerations. Indeed, the author violates his own well-expressed and sound judgment:

> Nor does the fact that the study is confined to what might be regarded as the economic, as opposed to the sociological, implications of mobility suggest that each of these is a distinct domain, not to be trespassed upon by specialists in the other. Since the boundaries that divide the social sciences reflect no comparable compartments in real life, research will probably be most fruitful if investigators roam wherever the specific nature of their problems leads them, so long as their competence assures a firm footing. (p. 3)

The emphasis on short-run economic factors is all the more unfortunate in

view of the SSRC's traditional encouragement of cooperation among the several social sciences.

As long as the study concentrates on "the extent and character of labor mobility," the emphasis on short-run economic factors is not too serious—it results in an incomplete but not necessarily distorted picture. However, once attention is turned to the determinants of labor mobility, whether personal or institutional, the inevitable difficulties implied above emerge. The author recognizes the difficulties but the implementation is unsatisfactory.

The chapter dealing with determinants is further handicapped by the scarcity of available data. Whereas the discussion of the extent and character of labor mobility is based almost entirely on empirical studies, the discussion of institutional determinants (to which half of the chapter is devoted) depends heavily on a few theoretical and impressionistic writings by labor economists. The author is so much at a loss for empirical materials in this connection that he feels obliged to refer to two British writings, although he specifically states at the outset of the volume that he is ignoring non-American contributions.

The chapter which may be of greatest interest to general economists is that concerned with the relevancy of labor mobility studies to certain assumptions and conclusions of the neoclassical theories of labor allocation. Specific attention is paid to four questions bearing on three assumptions and one conclusion of these theories: "(1) the extent of workers' knowledge of job opportunities and the ways in which they go about finding and taking jobs; (2) the criteria by which workers make their job decisions; (3) the extent to which the voluntary movement of workers is in the direction of higher paying firms; (4) whether the mobility of workers appears to be effective in reducing differentials in wages and other terms of employment among comparable jobs" (p. 187).

As is well known, empirical studies indicate that the "real" world is much more complex than the models of the neoclassicists. Parnes' analysis reaffirms this view but indicates somewhat more precisely the directions in which neoclassical theory might be modified in order to produce more realistic and useful models.

Although other minor criticisms may be made with respect to this survey (such as the relative neglect of materials on nonmanufacturing workers, the limited reference to mobility in and out of the labor force, and the failure to consider materials bearing on labor mobility in studies not primarily concerned with the subject), Parnes has made a valuable contribution to the field, not only by pointing out significant developments in knowledge in the past two decades but also by indicating the gaps and inadequacies. Indicative of the rapid progress in the field is the fact that since the appearance of the volume, labor mobility studies have been published, for example, by the Universities of Princeton, Illinois, and Columbia, a large-scale project has been launched at the University of Pennsylvania, and studies have been advanced at several universities and by the SSRC itself in the occupational-choice area.

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Arbitration of Wages. By IRVING BERNSTEIN. (Berkeley and Los Angeles: University of California Press. 1954. Pp. x, 125. $3.50.)

A relatively unknown phase of collective bargaining is the voluntary submission of unresolved wage differences to a neutral third party. Since in peacetime probably less than two per cent of general wage changes are reached in this fashion and since even these are concentrated largely in urban transit or other small firms, this ignorance is no surprise. In the five years here covered in detail, only 209 cases were found.

Nevertheless, as a possible alternative to a strike when negotiations break down over a matter of "a little more or a little less," wage-arbitration is worth this serious study by the former chairman of the Committee on Research of the National Academy of Arbitrators. Not the least useful contribution is the assembling of diverse opinions about the conditions under which such arbitration is likely to succeed.

The main portion of the monograph is devoted to classification and analysis of the cases. Of major interest is the analysis of the grounds stated by the arbitrators as the principal reasons for their decisions: intra-industry and inter-industry comparisons and costs of living, with other arguments usually having little weight. The difficulties in the way of using these criteria (and many others) are fully pointed out. Of course, in some limited classifications the sample is too small to justify generalization.

It is unfortunate that the author did not include an analysis of the arbitrators themselves. In evaluating the principles used it would be helpful to know how frequently certain reasons were advanced by economists or lawyers or others. Many of the quoted decisions were rendered by economists, but one wonders about the many others.

Bernstein has made a twofold contribution: one to general knowledge and the other in providing a ready reference for negotiators considering the possibilities of wage arbitration and unwilling to rely on the limited experience of business or union associates.

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Industrial Conflict. Edited by ARTHUR KORNHAUSER, ROBERT DUBIN and ARTHUR M. ROSS. (New York: McGraw-Hill. 1954. Pp. xi, 551. $6.00.)

This work is the result of collaboration in both editing and writing on the part of a psychologist, a sociologist, and an economist. It was prepared for the Society for the Psychological Study of Social Issues; but the three author-editors (each of whom made two separate contributions under his own name, in addition to sharing in two further chapters "by the editors") emphasize the fact that "This volume was conceived as an integrated and genuinely interdisciplinary approach to the issues of industrial conflict in the United States." On the whole, the remaining thirty-odd chapters serve to justify this claim, since they comprise a diversified but clearly classified series of attacks upon the problems of industrial conflict, with the economic aspects by no means underrepresented in relation to the sociological and psychological ones.

Obviously it is impossible, within the confines of a brief review, to analyze

or to mention separately the individual contributions of even a few of the thirty-nine persons who had a hand in this joint effort. Fortunately, however, the material is so well organized and integrated that it lends itself to certain meaningful observations which may serve to indicate what the full text has to offer. This is true partly because the editors have been signally successful in avoiding the poorly coordinated, "jumpy" type of manuscript which so often emerges as the product of group writing and research, and partly because they have provided an enlightening series of interlarding summaries, explanations and interpretations.

The general tone of the work is analytical, probing, skeptical, and sophisticated, rather than doctrinaire, dogmatic or naïve. In countless instances questions are asked rather than answered; and where answers are attempted, they are more likely to be pictured in intermediate greys rather than in absolute blacks or whites, with emphasis upon the qualification that more understanding and insight, as well as more facts, are needed before assured conclusions may be justified.

It is not even assumed that industrial conflict is always and necessarily bad. Whereas economists have been accustomed to thinking of it primarily in terms of overt belligerency, as evidenced particularly in terms of strikes, some sociologists look upon it as a sign of industrial democracy at work, in contrast to others who regard it as evidence of breakdown and disorder; while psychologists may see it as an expression of antagonistic interests and desires, at both the group and individual levels, which may have its therapeutic as well as its dangerous aspects.

But in any case, whether it be a dark cloud with silver linings or without, industrial conflict cannot be allowed to cover the entire horizon. It must be "handled," or curtailed, even though it cannot be (and conceivably should not be) entirely prevented. The major means to this end (coming under the three main categories of procedures for reconciling, compromising or adjudicating controversies, of devices for eliminating the sources of dispute, and of social controls by government) are examined in detail and in a manner which is competent and sometimes challenging but which contains little that is new to knowledgeable students of the field.

It is pointed out, as recent studies have indicated more and more clearly, that the social cost of strikes, taken as a whole, is small enough to be readily tolerable, and thus to justify the continued use of this vital adjunct to collective bargaining. One major exception, the national emergency strike, must necessarily be dealt with by government, but on a basis which allows for a considerable amount of improvisation within a broad framework of indicated expectations. The governmental emergency measures of a democracy in peacetime are inevitably conditioned by public opinion, which seems to be more responsive to direct knowledge and personal identification than to propaganda. By the same token, measures taken by industry to deal with substantive matters such as wages, hours and working conditions are more effective in curtailing conflict than are "communications" measures concerned with changing employee attitudes through morale-building, group-dynamics, or "the human relations approach."

There is repeated emphasis upon the twin facts that trade unionism, in its

pursuit of collective bargaining, has exerted a formalizing and stabilizing effect upon industrial relations, and that its aims and activities have far outrun the relatively narrow objective of merely trying to maximize the earnings of its members.

Although the bulk of the book is concerned with the United States, four brief chapters are devoted to a contrasting examination of the environment of industrial conflict in Sweden, in Soviet Russia, in Nazi Germany, and in the nationalized industries of Great Britain.

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Industrial Relations and the Government. By WAYNE L. MCNAUGHTON and JOSEPH LAZAR. (New York: McGraw-Hill. 1954. Pp. ix, 531. $6.00.)

The authors of this book, according to the publisher's announcement, recognize that there is more than law to the study of labor and the government. Consequently, while the book is primarily a text in labor law, it includes discussion of the historical, sociological and economic aspects of the problems.

The main structure of the book follows a labor-law format—law applied to the employment relationship, the rights of employers, the rights of employees, and cooperation. Each subject is treated historically, and "other aspects" are fitted in as well as can be expected.

From a layman's standpoint, the law is handled very well; the style is lively and lucid, without sacrificing detail and thoroughness. The strongest feature of the book is the way it shows how the reasoning in court decisions became more and more tortured under old laws, until new laws were obviously required. Any reader should gain valuable insight into the process which changes institutions to fit the times.

The book incorporates new materials, which however are often variations on an old theme. Labor is said to have emerged from the quasiparadise of the guild system, through a Hell of *laissez faire,* toward a Galbraithian paradise of a perfect balance of power, aided by government service functions, rather than regulation. The authors' debt to the Webbs and to the Commons and Perlman works is evident, both in content and in interpretation.

One aspect of this tradition seems to be the belief that the only enemies of employees are crooks or employers and their agents, often including the courts. This belief, in turn, leads to several unsatisfactory generalizations and assumptions. One is that legislation can be interpreted as a pendulum swinging between prolabor and proemployer sentiments (p. 48, p. 160). Another results in a cynical treatment of very real questions involving the freedom of workers to negotiate their own terms of employment (p. 24). A third results in a rather casual treatment of the labor monopoly problem; in this text, this problem is left up in the air (p. 74).

The authors lend recognition but not much understanding to these problems. This is most evident in the discussion of the Taft-Hartley Act (esp. pp. 154-60). With this Act, the pendulum seems at least to have swung into a new dimension, if the analogy has not broken down altogether. We are now concerned with the protection of individuals' rights from attack by labor organizations, as well as with the balancing of bargaining power. But this recent concern for

rights cannot be (and is not) dismissed as pure hypocrisy, as earlier appeals to workers' freedom were.

Since protecting individuals seems to weaken employee organizations, the authors are left with real dilemmas which they cannot resolve. They believe the pendulum has swung too far; but all we can hope for is "maturity, [with which] the importance of regulatory and enforcement functions of the government will diminish, while . . . mediation, conciliation, and arbitration . . . grow" (p. 160).

In sum, this book is a workmanlike job of presenting and implementing a well-worn approach to labor problems. A new approach would be highly desirable, but this book does not supply it.

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The System of Industrial Relations in Great Britain. Edited by ALLAN FLANDERS and H. A. CLEGG. (Oxford: Basil Blackwell. 1954. Pp. 380. 30 s.)

In this volume of six essays, a group of British scholars has provided a long-needed and comprehensive view of British industrial relations. The authors, all but one on university staffs, stay within the intent of the subtitle, "Its History, Law and Institutions," and integrate historical development with current practice in concise fashion throughout. The stimulating opening chapter "Social Background" by Asa Briggs, an Oxford historian, ranges from the impact of organization on the factory system to the current status of management and human relations. He bases his interpretation largely on three changes "which have influenced the background of relations between employers and workers—the advance, by no means a continuous advance, of unskilled labour; the rise of socialism; and the growth of the welfare state."

Kahn-Freund, lecturer on labor law at the London School of Economics, gives a meticulous exposition of the "Legal Framework" covering the nature of the work contract and the growth of government participation. He does not overstate the importance of the law:

> There exists something like an inverse correlation between the practical significance of legal sanctions and the degree to which industrial relations have reached a state of maturity. The legal aspect of those obligations on which labour-management relations rest is, from a practical point of view, least important where industrial relations are developed most satisfactorily. There is, perhaps, no major country in the world in which the law has played a less significant role in the shaping of these relations than in Great Britain and in which today the law and the legal profession have less to do with labour relations. In the writer's opinion this is an indication that these relations are fundamentally healthy.

Kahn-Freund continues with a statement of a philosophy which pervades the entire volume. "Reliance on legislation and on legal sanctions for the enforcement of rights and duties between employers and employees may be a symptom of an actual or impending breakdown and, especially on the side of the unions, frequently a sign of weakness, certainly not a sign of strength."

J. D. M. Bell, a Glasgow historian, concisely discusses trade union structure, government, objectives, and methods. His analysis of trade union purposes

moves beyond the traditional improvement of wages, working conditions and the status of workers and includes "extending the area of social control of the nation's economic life, and participating in that control." H. A. Clegg of Oxford provides a much-needed chapter on the extensive organization of both private and public employers for collective bargaining which contrasts strikingly with developments in the United States. The organizational response of employers to union growth presents unique difficulties to the researcher, and the author makes the book's most valuable contribution in an area relatively unexplored to date.

Clegg also collaborates with T. E. Chester, director of The Acton Society Trust, in the chapter on "Joint Consultation" which, like the Whitley system in government service, is of considerable interest but has no substantial parallel in this country. Allan Flanders, senior lecturer in industrial relations at Oxford, provides a chapter on the evolution and process of collective bargaining as both an economic device and a social institution. Flanders emphasizes the difficulties of applying national agreements at the workshop level and raises the basic question of deciding "what is the concern of society as a whole, what should be settled on an industrial scale, and what is the affair of the employees in a single enterprise or a smaller group within it."

The editors make an unnecessary explanation of the "concentration on formal institutions" in view of the recent advance in the "new school of 'human relations in industry.'" Footnote references provide ample compensation for lack of a bibliography. While, with the possible exception of the chapter on employers, little of the book is devoted to new material, the authors have, within the scope of a single volume, produced an extremely well-written and thorough introduction to their subject—probably the best text available in the field.

HARRY STARK

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Industrial Pensions. By CHARLES L. DEARING. (Washington: Brookings Institution. 1954. Pp. x, 310. $3.75.)

Not only in the public thought of the day but also among directly interested groups of employers and organized labor there is much unclear thinking in the matter of industrial pensions. This controversial problem sounds simple when approached in terms of the generalities of labor organizations, and even of governmental agencies. Among the latter are the conclusion that social insurance and pensions should be among the primary charges upon the employer's income, that industrial pension and other welfare schemes are conditions of employment and must be bargained for. Powerful labor groups assert that unilateral employer contributions "belong to the workers," that benefits should be based on need rather than earnings, and that the entire cost burden should be placed upon employers as a means of forcing them to bring about a more adequate federal old age and survivors' insurance program. Dearing has plunged into the heart of this controversial field, and, in a thoroughly scientific fashion has succeeded in clarifying the issues so that they should be understandable to the layman, to employers and to labor leaders alike.

There is presented an historical picture of the pension movement prior to the depression of the 1930's, the effect of the depression in bringing about contributory pension plans with vested rights for employees, and finally the wartime and postwar stimulation of pension plans in the form of employer-financed schemes with little or no vesting of rights for workers short of retirement. The influence of the National Labor Relations Board's interpretation of the law in 1948, and the subsequent Circuit Court of Appeals decision in 1949 setting forth the principle that no employer can initiate, terminate or alter any welfare program, whether contributory or noncontributory, voluntary or compulsory, without collective bargaining are shown to have forced a hasty development of industrial pensions which in many respects are not in the interest of the worker, the employer or the public.

The analysis of the structure and operation of various types of pension plans is invaluable. Dearing, basing his figures on good employment and favorable factors, anticipates by 1960 a participation by about 22 million workers, or approximately two-thirds of the work force which would in any way be eligible for coverage by private pension systems. As to contributions, the author states "In the long run the true economic cost of maintaining a pension system will be determined by the extent to which the claims of future beneficiaries for goods and services can be satisfied out of the enhanced productivity generated by the productive employment of accumulated pension funds." Following an analysis of the amount and nature of industrial pension contributions in the various trade and industry groups, Dearing estimates the annual aggregate contribution needed to support the plans in 1950 at something over $2 billion. Making adjustments for increased coverage, the extension of funding for past services, liberalization of benefits, and a moderate allowance for an increased cost of living, the author reaches a projected payment by companies and employees of about $6.6 billion annually by 1960. He calculates new money savings (including pension contributions) at from $18 to $22 billions annually, and outlets for new capital at $17 to $18 billions, suggesting possible investment problems in the 1960's.

Particularly illuminating for persons directly or indirectly involved with industrial pensions as employers or potential beneficiaries, are the author's appraisal and critique of industrial pension plans, and his discussion of the allocation of responsibility for pension financing. It is pointed out that since not more than 32 per cent of the total labor force can expect coverage, industrial pensions are capable of performing no more than a supplementary role in solving the national problem of old-age security. Most of those covered by existing pension plans must remain with a single employer throughout the major portion of their working life and to normal retirement age in order to realize benefits. The net effect of mandatory collective bargaining, asserts Dearing, has been to freeze inherent defects into the expanding pattern of pension development. Also, the incorporation of need as the basis for pension eligibility by powerful union groups violates the concept of pension contributions as deferred wages, and results in calling upon workers in the higher earning brackets to subsidize the low-wage earners.

The allocation among government, management and individual workers of direct responsibility for provision for old age security should be conditioned by economic standards and social criteria consistent with a free enterprise system.

Sound public policy would seem to place the prime responsibility on the individual, whether operating unilaterally or collectively, for providing the level of retirement income desired beyond that of the federal program. Nevertheless, there is a valid role for industrial management, Dearing states, through pension programs adapted to the operating policies, financial capacity and competitive position of individual corporations.

EARL E. MUNTZ

New York University

Wildcat Strike. By ALVIN W. GOULDNER. (Yellow Springs, Ohio: Antioch Press. 1954. Pp. 179. $3.00.)

The author and his research team had the good luck to be able to study firsthand a wildcat strike from beginning to end in a small (225 employees) gypsum plant. Other research in this plant is reported in the same author's companion volume, *Patterns of Industrial Bureaucracy.*

The author has three objectives: to describe a wildcat strike in detail; to explain why and how it happened; and to develop the "rudiments of a general theory of group tensions." Each objective is accomplished with clarity and perception. Primarily sociological in orientation the study contains material of practical moment for union and management representatives and of factual and academic interest for students of industrial relations and group tensions in several disciplines.

The description and explanation of the strike make up two-thirds of the book. A seemingly stable labor relationship based on close worker-supervisor relations and on fulfillment of worker expectations—an "indulgency pattern" —was disrupted by changes stemming mainly from the economics of postwar competition. Technological innovations, a change of plant managers, and replacements among middle management brought a circular process of tightening supervision, violation of worker indulgency expectations, loss of worker motivation to work and obey, and worker aggressiveness. In the resulting tension an inadequate grievance machinery and a leadership on both sides preoccupied with status and market considerations were incapable of preventing the strike. It was settled by an agreement which safeguarded the status interests of union and company leadership by "bureaucratizing" their relationship without resolving underlying causes of tension. The experienced observer of industrial relations will find little that is analytically new in this part of the study, but the picture of the wildcat strike is unusual for fullness of detail, authenticity, and sureness of understanding.

In the rest of the book the author attempts to generalize the findings of this case study into principles of a general theory of group tensions. He codifies into seventeen general propositions the factors which create tension in social systems; lists seven different "disorganization patterns" into which these tensions arrange themselves; and distinguishes three different patterns of "defenses" or responses to tensions. Some of these principles seem obvious truisms clothed pretentiously, but all ring true, and many provide genuine insight toward the author's goal of erecting a bridge between pure and applied sociology.

VAN D. KENNEDY

University of California, Berkeley

Population; Social Welfare and Living Standards

World Population and Production: Trends and Outlook. By W. S. WOYTINSKY and E. S. WOYTINSKY. (New York: Twentieth Century Fund. 1953. Pp. lxii, 1268. $12.00.)

Political arithmetic in the twentieth century is a very different art from that in the seventeenth. The statistical brickmakers, who were formerly hard put to it to find straw, are now embarrassed by an excess of it. Doubtless its quality varies and the problems of selection are more difficult than ever before. Nevertheless the movement from scarcity to abundance is the most outstanding characteristic in this field of human endeavor.

All this is reflected in the 1,268 closely printed pages of this monumental effort of the Woytinskys. It is a work in the tradition, not of mere compilers of statistical tables, but rather of that different species who are inspired by curiosity to probe both quantitatively and qualitatively into the multitudinous activities of man. It is not easy to place it by comparison with other works. It differs from the *Statesman's Year Book* in being organized according to subject-matter and not countries, and in attempting interpretation and tracing antecedents. At some points it may seem to resemble Zimmerman's *World Resources and Industries* but its attempts at interpretation are less ambitious, its range of topics somewhat wider, and its preoccupation with measurement greater. It is rather more quantitative and at some points less detailed in its descriptions than Chisholm's *Handbook of Commercial Geography* (rewritten by Stamp).

It is not surprising that a reference work of this type should have appeared at a time when the volume of statistical material and the extent of specialization are rapidly expanding and only a few professional scholars can hope to follow the numerous and widely scattered publications which reflect this expansion. The present work will undoubtedly be of great value to a wide range of readers, both professional and lay. It is a ready reference, not only to facts but also on some subjects to quantitative methods and even historical origins. The industry that has gone into the work is staggering and if Congressional probers of alleged waste in government belonged to the reading section of the public, they might be expected to point to the fact that two persons have accomplished a task of such magnitude as might have engaged the services of a whole bureau!

It is in no sense a detraction from the Woytinskys' accomplishment to point to a few shortcomings, some of them inevitable in a work of this scope. First, there is the difficulty in keeping such a work up to date. It could presumably be met only by issuing periodic supplements, which, after a time, would grow cumbersome. The size and expense of publication may be a deterrent to new editions: a more modest form of publication, with sparser illustration might possibly have been better adapted to survival.

Next, the range of qualitative material carries with it dangers of lapsing into superficiality at some points. The Woytinskys appear on the whole to have come out well in this respect. No single reviewer can hope to judge the adequacy of all interpretations and selections in so wide-ranging a work. Space

will not permit a detailed examination and two examples only will be discussed here.

First the Huntington theory of the relation of climate to energy is described (p. 29) uncritically without reference to the severe criticisms to which his methods have been subjected and to which he never made an effective reply. Recent studies in the relation of climate to man and animals are not touched on in the text or bibliography.

Second, it is stated (p. 139) that ". . . the net reproduction rate measures the vitality of the population in terms of the *long range* trend, rather than current changes." Also, "A net reproduction rate of 1.0 indicates a state of demographic equilibrium in the long run." These statements may seem plausible, but I do not think I should be alone among population students in regarding them as dangerous and misleading. Not even a trend line calculated empirically to fit a series of annual net reproduction rates, nor even a moving average, let alone the rate for a single year, could claim such properties. No reference is given in the bibliography to the work of Hjanal, Karmel and others in recent years on the net reproduction rate.

In neither of these two examples do I wish to suggest that the authors were obligated to survey the particular points in question in exhaustive detail. But it does seem justifiable to suggest that they would have been better advised to have been more careful in selecting the theories which they described and to have avoided some of the categorical statements which they made. Their discussion on the points in question should have contained either more or less than it did.

These, however, are only points of detail and the feeling with which one closes the work can only be one of admiration for the immense task which the authors have carried to a successful conclusion.

E. F. PENROSE

The Johns Hopkins University

Workmen's Compensation. By HERMAN M. SOMERS and ANNE R. SOMERS. (New York: John Wiley & Sons. 1954. Pp. xv, 341. $6.00.)

Students of social security have long complained that workmen's compensation, the oldest of our social insurance programs, is the one about which least is known. The standard studies of workmen's compensation administration were written between 1924 and 1940: the most recent comprehensive technical book, Larson's *The Law of Workmen's Compensation*, is, as its title suggests, written primarily for lawyers, and the only study which frankly aimed to appraise the achievements of the system by reference to its social objectives, namely Reede's *Adequacy of Workmen's Compensation*, was based on data as of 1940. In contrast to our extensive knowledge of the functioning of other social insurance programs, we have had to be content in the field of workmen's compensation with estimates of total expenditures and until very recently no one had even ventured to estimate the total number of beneficiaries.

It must be admitted that the effort to assess the present system demands great fortitude on the part of the investigator. The many different jurisdictions, the diversity and complexity of the laws, statutory and administrative, the variety

of types and standards of administration, the involvement of private insurance and the shocking paucity of officially released data, coupled with the wide-ranging impact of workmen's compensation legislation which requires the student to delve into the technical literature of law, insurance, medicine and industrial relations probably explain why the field has been so long neglected.

Fortunately Professor and Mrs. Somers have not allowed these obstacles to deter them. They have produced a study which is remarkable not only for the completeness of its coverage and breadth of treatment, but also for the exhaustiveness of the sources and authorities consulted. At long last we are in a position to know what workmen's compensation is like.

The findings reported by the Somers (with a pungency of style that is refreshing in so technical a work) confirm one's worst suspicions. The program has not only failed to keep pace with the changes that have occurred in the economic and social environment since it was inaugurated: it is not even meeting the test of its own original objectives. The annual cost of workmen's compensation is now about $1.3 billions, or about the same as unemployment compensation. Yet neither employers nor workers pay anything like the same attention to its achievements and administration, while the public interest is in effect zero. Of this large sum, only about half goes to workers in the form of benefits: the remainder is consumed by overhead costs, primarily those of insurance but also legal fees and administration. Employers have not reaped the alleged advantages of financing through competitive private insurance carriers because uniform manual rates have been established with expense loadings that reflect the experience of the less efficient carriers (some 200 carriers, many small and inefficient, share in the business) while the more efficient make large profits. Nor do employers enjoy the economies of rates based on national experience. Despite original hopes, the administration is almost incredibly litigious (claimants' legal costs consume between 3.5 and 16.6 per cent of the cash benefits in the different jurisdictions) and the authors maintain that such advances as have been made over the years have come at the expense of ever-increasing complexity, ambiguity, litigiousness and costliness.

In fact, apart from some growth in medical benefits, the advances are difficult to discern. The fixed dollar maximums and the limits to duration have resulted in payments that today cover little more than one-third of wage loss, while for the permanently injured and survivors of deceased workers the percentage is around 20. Although expenditures on medical care have increased, the medical program has grave deficiencies and is subject to little supervision or qualitative control. Rehabilitation, which might have been expected to be an area in which workmen's compensation would excel, has been disappointing, with the notable exception of the programs of one or two insurance companies. Indeed, the chapter on rehabilitation is perhaps the most dismal of all for it is a record of missed opportunity. The state administrations have in general been starved of appropriations, and salaries are disgracefully low in view of the highly technical nature of the work. Officials have been relatively helpless in the face of the powerful insurance and medical groups whom in theory they should supervise and control. Even in regard to prevention, the much-advertized achievements of workmen's compensation are, the Somers suggest, largely

in the past: other influences today far surpass those exerted by the workmen's compensation system.

What then is the future of this once important social security program? It is here, perhaps, that the authors are least satisfactory. They appear to place their faith in the further development of the already substantial number of supplementary security systems, some public, some private, which in total somewhat mitigate the deficiencies of workmen's compensation. But as they admit, this complex series of measures involves much overlapping and considerable duplication of payments while offering no assurance that all cases of need for income or medical care will be provided for. Moreover, this duplicating series of programs is costly, and while it may be true, as some European observers hold, that America is rich enough to afford a wasteful social security system, it is difficult not to think that sooner or later both employers and workers will begin to ask whether they could not get better value for the many premiums and social security taxes they pay. The Somers recognize that the future of workmen's compensation will be greatly affected by what action the nation takes in regard to temporary and permanent disability insurance and the socialization of the costs of medical care through social insurance or otherwise. But one would have welcomed a more specific indication of the precise role of workmen's compensation on the basis of alternative hypotheses as to the trend of social security legislation in general. For the question that is left in the reader's mind is whether workmen's compensation is worth salvaging.

But although the authors refrain from indicating the long-run solutions they would prefer, their study will rank as one of the most important books that has appeared in the field of social security for many years. It fills in an admirable way a major gap in our knowledge of social security institutions that had too long existed. And now that the inadequacies and inefficiencies of workmen's compensation have been so fully documented, the book will surely act as a powerful stimulus to a reconsideration of the role of this program, and, so long as it continues in existence, to legislative and administrative reforms.

EVELINE M. BURNS

New York School of Social Work, Columbia University

Our Needy Aged: A California Study of a National Problem. By FLOYD A. BOND, RAY E. BABER, JOHN H. VIEG, LOUIS B. PERRY, ALVIN H. SCAFF, and LUTHER J. LEE, JR. (New York: Henry Holt. 1954. Pp. xxx, 401. $4.50.)

Old Age Assistance (OAA) receives heavy financial support from the federal government. It is administered by state and local governments and consequently the magnitude, benefits and eligibility requirements vary widely among the states. California's program is in many ways distinctive: it is the most ambitious, the most publicized, and the most controversial.

This first full-scale study of the California program by a team of Pomona College social scientists will command wide attention because of its unhesitating recommendations with respect to all of the controversial features of the program.

The study is comprehensive. Its ten chapters concern: the socio-economic

characteristics of California's aged; the historical and political background of the present OAA program; the substantive provisions of the California law, its differences from that of other states, and the administrative experience under it; the costs of OAA in California and nationally; attitudes and opinions of the aged and of the county administrators toward the program; and, finally, a set of recommendations.

The major contribution of the study is the wealth of material newly developed by a special 1952 survey of 890 of California's noninstitutional aged, of which roughly one-third received assistance. Based upon this survey (and other sources) a number of findings emerge, among them: (1) California has more people on OAA and more aggregate expense than any other state. (2) California's aged are typically much better off than those in other states, and OAA is largely responsible. (Whether this indicates merely that the program is more nearly adequate, or whether it indicates extravagance is an important question that is not analyzed.) (3) Despite its relative attractiveness, OAA has not drawn a disproportionately large group of indigent aged into the state. (4) Large increases in the size of maximum grants (from \$35 to \$80 since 1935) have been partially reflected in real terms (from \$35 to \$41) over the same period.

Usefulness of some of the data presented is impaired by insufficient attention to questions of statistical significance (the methodological appendix is not adequate in this respect), and by the unfortunately limited amount of cross-classification of the data that is, I imagine, a consequence of the smallness of the sample. Notwithstanding, the data are useful, and it is regrettable that the basic data are not fully presented in an appendix.

The attitudinal data are interesting, but the biases of the respondents are insufficiently considered for the attitudes to have the evidential value that they are later given. Majority opinions of the present group of age toward eligibility requirements quite naturally reflect the majority characteristics of the group with respect to age, citizenship, length of residence, and so on. The bias of county administrators is to keep their administrative burden in hand (" 'We would be swamped' if the requirement [of citizenship] were removed. . . ." [p. 308]). A further difficulty is the failure to analyze opinions in terms of key variables: "The reported ability of children to help support their parents varies with the parents' educational level" (p. 298)—and, I suspect, with children's income.

Among the controversial recommendations concerning eligibility for OAA are retention of the citizenship requirement, more stringent property limitations, and retention and strengthening of relatives' responsibility. Also recommended are provisions for reimbursement to the state from the estates of recipients, and for a continuation of county (rather than state) administration.

To understand the recommendations it is necessary to recognize an implicit and unestablished premise that virtually preoccupies the authors: the cost of the program is in imminent danger of becoming *too high*. This premise might be justified if either the burden of the program is (or promises to become) oppressive, or if the level of payments to individuals is extravagant. Despite an occasional disclaimer the former is the apparent fear of the authors. The cost in 1953 of the program was \$226 million, of which about half was paid by the

federal government. The reasons given for thinking this is excessive are: (1) this amount is about 9 per cent of the total expenditures of the State and local governments (almost as much as is spent for highways and bridges), (2) it amounts to about $20 per capita, (3) it is high relative to expenditures in any other state. This evidence is not sufficient, and the issue is too central to be resolved by assumption.

Disagreement with some of the recommendations is beside the point. The point is that most of the recommendations do not emerge from the evidence of the study. Consider the citizenship requirements, which are recommended for the following six reasons (pp. 347-49): (1) three-fifths of the county directors and four-fifths of all the aged in the survey favored it, (2) the proximity of California to the Mexican border, (3) the availability of general relief to those not on OAA, (4) the process of becoming a citizen is not a very difficult one, (5) dropping the requirement would make enforcement of the immigration laws more difficult, and (6) the alternative would cost an additional $35 million to a state which is already spending more than twice the amount of any other state. Of these points only the first, which is irrelevant, and the last, the significance of which is unestablished, emerge from the study.

Relatives' responsibility is endorsed "because it is sound in principle, both morally and economically" (p. 352). Most surprising is the recommendation concerning county administration. The showing in previous chapters of unequal burdens on the counties, of uneven administration among counties, and related findings led, I thought, to the opposite conclusion. The chief explanation is the authors' belief that "local and State governments have both suffered in recent decades from the transfer of some of their functions to higher levels" (p. 367).

The authors are entitled to their judgments, which neither enhance nor detract from their substantial substantive findings. My chief concern is that these opinions will be given undue credence because they are found at the end of a long book.

PETER O. STEINER

University of California, Berkeley

Contributions of Survey Methods to Economics. Edited by LAWRENCE R. KLEIN. With papers by GEORGE KATONA, LAWRENCE R. KLEIN, JOHN B. LANSING, JAMES N. MORGAN, Survey Research Center, University of Michigan. (New York: Columbia University Press. 1954. Pp. ix, 269. $5.00.)

This is not a book for purists. It is the record of a program of research in process of development, and a composite portrait of a new school of believers in an interdisciplinary approach to economics. The aim of this school is to wed economics and psychology through the method of direct surveys. If the concepts employed seem at times somewhat forced or fuzzy, we must remember that the first steps in a new field are necessarily halting and sometimes misguided. If technical machinery is wrenched into services it was never designed to perform, we must respect the will to get on with the work at hand rather than be content with blueprints for perfection. If emphasis on the scientific character of the enterprise seems rather too insistent and at times pedantic, we must recognize the soundness of the inspiration and respect the ideal aimed

at. And, finally, if the book shows flashes of real genius and contains analysis of the first rank, we must credit these to the vitality of a sound idea in attracting exceptional talent.

The book opens with a long and informative chapter by J. B. Lansing on the concept of consuming unit and the accounting framework used to record consumers' economic behavior. Next is a chapter by George Katona outlining a theory of consumer behavior in which psychological and institutional elements are prominent, and to which the results of re-interview surveys are shown to lend support. There follow two chapters by J. N. Morgan on the determinants of consumer saving; these are similar in theoretical inspiration to Katona's chapter, but they are distinguished by the use of a "net worth" concept of saving (which includes spending on durable consumer goods) and by truly heroic efforts to employ the tools of "analysis of variance." Nearly all practicing statisticians do this sort of thing, and hardly anyone likes the other fellow's compromises; but, on balance, Morgan seems not to claim to have proved too much. The final substantive chapter, by L. R. Klein, adduces an econometric model of consumers' saving behavior which incorporates most of the variables—economic, demographic, and attitudinal—that Katona and Morgan find to be influential. The model provides an interesting case of nonlinear relationships among economics variables, and leads to an important qualification of the relationship between real wealth and spending that has figured so prominently in monetary and fiscal theory. The book is introduced by an apt summary of contents and closes with some thoughtful comments on the role of survey methods in business cycle research—both by the editor.

The book is a contribution on several levels. It adds to our knowledge of consumer behavior. Its structure recapitulates the stages—sometimes groping, sometimes inspired, but generally gaining in authority—through which a program of empirical research usually passes; and it will therefore give depth and realism to discussions of research methodology. But best of all, it teaches us something about the Survey Research Center. Here is an organization with an unrivaled body of data on consumer behavior that has not been made generally available to scholars. Like high explosive, it is to be handled only by experts, which usually means that mixed breed psycho-socio-economist. Now we are given an account of the tricky stuff, are told some of the reasons it is difficult to handle, and are shown some of the expedients by which it can be made to yield up its lessons. One gains the impression that the stuff is in competent hands, but neither the difficulties nor the expedients seem half so esoteric as we were led to expect. There may even be simple economists among us who feel that the stuff should be declassified.

MILLARD HASTAY

National Bureau of Economic Research

Consumer Behavior: The Dynamics of Consumer Reaction. Edited by LINCOLN H. CLARK. (New York: New York University Press. 1954. Pp. viii, 128. $4.00.)

This handsomely printed volume is the first issue of a proposed annual pub-

lication, the product of a new Committee for Research on Consumer Attitudes and Behavior, based at Ann Arbor, Michigan. Active leaders include members of the Survey Research Center, University of Michigan, but the participants have included representatives from several universities and several disciplines, a number of market-research agencies, and others from the nonacademic world. Consumers Union has contributed financial support.

The exploratory studies here presented range "over a variety of problems connected with consumer decision and choice." George Katona and Eva Mueller, joint authors of *Consumer Attitudes and Demand, 1950-1952* (1953), present two thoughtful papers on purchase decisions—"a central topic of psychological economics"—with special reference to the research design (Katona) and the sample survey (Mueller). They are mainly concerned with "the kind and extent of deliberation that accompanies the purchase process," and with "the specific conditions that give rise to careful deliberation."

Ruby T. Norris reports on a field study of house purchases in the New London (Connecticut) area between mid-August 1952 and mid-April 1953—on reasons for buying, alternatives considered, how the house bought was located, how intensively it was looked for, and what the buyers wanted but did not get. The results bring out the wide diversity of buyers' attitudes, divergencies between volunteered opinions and responses to leading questions, and differences between the buyers' judgments and those of the interviewers.

The other two major papers, concerned with living as well as with buying and consuming, are stimulating, even provocative. William H. Whyte, Jr., of *Fortune's* editorial staff, illuminatingly analyzes "the new suburbia" as represented by Park Forest (near Chicago), a "filiarchal" "city of permanent impermanence" displaying "extraordinary homogeneity" and an increasingly communal way of life. Nelson M. Foote explores "The Autonomy of the Consumer," by which he means "the consumer's self-determined use of his sovereignty, his utilization of the opportunity to create his own style of spending." He finds this autonomy worth "cultivating" by the researcher and his employer. But he mainly presents ten challenging research hypotheses relating specifically to what he considers the "new era" that Americans have entered—in which real income will rise chiefly through technical improvements without exertion or self-denial.

A final group of brief papers treats of technical problems in measuring consumer preferences. The Appendix contains a statement about the Committee, summary minutes of its first two annual conferences held in September 1952 and 1953, a subcommittee report on research program, and a short Bibliography on Consumer Behavior.

Economists are increasingly recognizing the importance of consumption in the United States and other advanced economies. Though it has been studied from many standpoints, consumption has so many aspects that our understanding of it is all too superficial and inadequate. Now the American consumption level has risen far above that of 1929, which W. H. Lough discussed in his *High-Level Consumption* . . . (1935), and there is serious talk of "doubling our standard of living" in 25 years or so. Whatever their individual bias, economists of many specialties should therefore welcome the contributions of this

new interdisciplinary body seeking to promote empirical studies of consumer behavior with a view to better understanding of the future.

JOSEPH S. DAVIS

Stanford University

Unclassified

Economics in General Education. Edited by JAMES GEMMELL, SEYMOUR HARRIS, and S. P. McCUTCHEN. (New York: Joint Council on Economic Education. 1954. Pp. 151.)

In late summer, 1954, the Joint Council on Economic Education sponsored a conference of economists, educators and administrators of schools of education to discuss the role of economics in general education. The proceedings of this conference have been published under the title given above.

The Joint Council on Economic Education is "a non-profit educational organization created to assist school systems and teacher educating institutions in improving the quality of social and economic education through curriculum research, workshops, seminars, in-service education programs and the preparation of materials for teachers and pupils" (cover page). From the time of its organization in 1948, the Council has carried on a varied program of activities, including a sponsoring role (in cooperation with various colleges and universities) in some 120 workshops in economic education for public school teachers.

The publication here under review is made up of summaries of various papers presented or developed at last summer's conference. The Part I papers deal with such general issues as the importance of economic understanding in a free society (Roy Price, Syracuse University), the nature of economic understanding (Ben Lewis, Oberlin College), the main steps in economic analysis and the relationship of analysis and policy (Seymour Harris, Harvard University), and major issues in economic education (Lewis Wagner, Iowa State).

The Part II papers deal with the organization of college courses in economics. The first is a committee report on the terminal course in economics, including an analysis of the aims and organization of a terminal course and a brief review of several existing or proposed course organizations. The second is a report of a similar study of the interdisciplinary course.

The Part III papers deal with suggestions for the treatment of particular topics in the secondary schools. The first presents a suggested frame of reference for the teaching of economics in the secondary schools (Arno Bellack, Teachers College, Columbia University). The second is an outline of how the functioning of the economy might be presented, using the problem of unemployment as a point of departure (E. T. Weiler, Purdue University, and Glenn Ogle, director of the St. Louis Regional Council on Economic Education). The third is similar to the second, except that the point of departure is agriculture (James Calderwood, Committee for Economic Development). The fourth follows the same pattern, with the consumer as the point of departure (Persia Campbell, Queens College). The fifth paper is a brief description of an historical approach to a study of inflation (Seymour Harris). The sixth is a suggested technique for developing (through class participation) an under-

standing of the problems involved in maintaining economic stability (Lawrence Senesh, Joint Council on Economic Education). The final paper in this section presents an illustration of what a teacher must know if he is to do an effective job of conveying an understanding of the issues in the area of income distribution (Lewis Wagner and C. C. Trillingham, Superintendent, Los Angeles County Schools). Part IV contains but one paper, a committee report on the general subject of needed research in economic education.

I would recommend a reading of this publication to all college teachers of economics, particularly to those who have had no contact with the workshops or other activities of the Joint Council. These papers contain no definitive expositions of theory or teaching technique but they do convey the "flavor" of this program in economic education. To those who believe that it is sufficient to develop a small, well-trained cadre of professional economists, to those who question the value of a "little knowledge" in economics, to those who are unconcerned by the growing problem of communication between the professional economist and the layman (including perhaps his own students), to those who look on the professional educators as a hostile, anti-intellectual force in education, these papers present a real challenge. Whether the goals and methods of the Joint Council be right or wrong, here is a group of men trying to do something in economic education which may well be of unique importance. This being the case, an attitude of rigid isolation on the part of most professional economists hardly seems to be appropriate.

BENJAMIN A. ROGGE

Wabash College

TITLES OF NEW BOOKS

Editor's Note: The following list includes titles of French, Spanish and Dutch publications which have been supplied, respectively, by Jean-Marcel Jeanneney of the Fondation Nationale des Sciences Politiques, Paris, Victor L. Urquidi, Director of *El Trimestre Económico,* Mexico, D.F., and P. J. Verdoorn, of the Centraal Planbureau, the Hague, correspondents of the *Review*.

Economic Theory; General Economics

ALLAIS, M. *Les fondements comptables de la macroéconomique—les équations comptables entre quantités globales et leurs applications.* Ouvrage publié avec le concours du Centre National de la Recherche Scientifique. (Paris: Presses Univ. de France. 1954. Pp. 91. Fr. 900.)

BARKER, C. A. *Henry George* (New York: Oxford Univ. Press. 1955. Pp. xvii, 696 $9.50.)

CLAY, H., ed. *The inter-war years and other papers. A selection from the writings of Hubert Douglas Henderson.* (New York: Oxford Univ. Press. 1955. Pp. xxviii, 445. $6.75.)

CONGARD, R. P. *La demande et le monopole* (Paris: Sté. d'Edit. d'Enseignement Supérieur. 1954. Pp. 384. Fr. 2200)

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NOTES

A nominating committee consisting of Ewald T. Grether, William Haber, Harlan L. McCracken, Aryness Joy Wickens, Harold F. Williamson, and Edwin G. Nourse, chairman, has submitted the following slate of nominees for 1956 officers of the American Economic Association:

President: Edwin E. White, University of Wisconsin

Vice President:

Richard B. Heflebower, Northwestern University
Paul T. Homan, University of California, Los Angeles
Fritz Machlup, Johns Hopkins University
Ralph A. Young, Board of Governors, Federal Reserve System

Executive Committee:

Henry B. Arthur, Swift & Co., Chicago
William J. Fellner, Yale University
Walter E. Hoadley, Jr., Armstrong Cork Co., Lancaster, Pa.
Richard A. Musgrave, University of Michigan

Representative of Social Science Research Council:

John P. Miller, Yale University

The annual meeting of the Association will be held at the Hotel Commodore, New York, December 28-30, 1955.

PUBLICATIONS

The Graduate School of the University of the East, Manila, Philippines, began publication, in 1954, of a quarterly journal entitled *Economic Research Journal*, devoted mainly to economic problems of the Philippines

Yiddish Scientific Institute—Yivo. The Commission on Research of the Yiddish Scientific Institute, 535 West 123rd Street, New York 27, N.Y., as part of its regular program, is compiling a continuing bibliography of social scientific studies in all aspects of American Jewish life. Scholars and communal agencies are requested to forward information about recent or current studies, published or unpublished

INFORMATION BUREAU FOR AMERICAN SCIENTISTS VISITING GERMANY

The "Atlantik-Brücke," a group of private citizens interested in furthering better understanding of Germany in the United States and vice versa, has established an Information Bureau. The bureau provides, particularly to visiting Americans, information on German research institutes, universities, libraries, scientists, their publications and their research in progress in the field of German social sciences Interviews with experts on economic, social or political questions will be arranged on request. Communications should be addressed to the Information Bureau on German Social Sciences, Hamburg 13, Harvestehuderweg 9.

Death

Victor W. Bennett, chairman of the department of marketing, University of Miami, died in March 1955.

Appointments and Resignations

Henry G. Aubrey is on leave from the research department of the Federal Reserve Bank of New York to serve as economic consultant to the Harvard University's Graduate Faculty of Public Administration team of advisers to the Pakistan Development Board.

James A. Barnes, of Temple University, has been visiting professor of economics at the University of Miami during the academic year 1954-55.

Harold Bierman, Jr., has been appointed assistant professor of accounting in the School of Business, University of Chicago, effective October, 1955.

Gladys Boone, professor of economics and chairman of the Division of Social Studies at Sweet Briar College, has spent sabbatical leave during the second semester 1954-55 at the Institute of Industrial Relations, University of California, Berkeley.

George H. Borts has been promoted to associate professor of economics at Brown University.

Jess W. Brandon has been promoted from assistant professor to associate professor of accounting in the School of Business Administration of the University of Miami.

William N. Breswick has resigned from Southwest Research Institute, San Antonio, to become associate economist at the Phoenix office of Stanford Research Institute.

Donald J. Butterworth has been appointed associate professor of marketing at the University of Florida.

Burnham O. Campbell has been appointed acting instructor in economics at Stanford University.

Alan R. Cerf, of Stanford University, has accepted an appointment as assistant professor of accounting in the School of Business Administration, University of California, Berkeley.

Lester V. Chandler has been appointed chairman of the department of economics and sociology at Princeton University, replacing Richard A. Lester who is to be on leave next year.

H. W. Cordell, of Ohio State University, has been lecturer in marketing at the University of Florida in the second semester of the past academic year.

Virgil D. Cover, on leave from Syracuse University until September 1956, is visiting professor of Business Administration at the University of Rangoon, Burma, on a Ford Foundation appointment.

Richard M. Cyert has been promoted to associate professor of economics at Carnegie Institute of Technology

Frank Dunbaugh has been promoted to associate professor of marketing in the School of Business Administration of the University of Miami.

Warren W. Eason, of Johns Hopkins University, has accepted an appointment as assistant professor of economics and bicentennial preceptor at Princeton University.

Corwin D. Edwards, visiting professor at the University of Virginia, has accepted an appointment as professor of government and business in the School of Business, University of Chicago, effective October 1955. In April of this year he delivered four Merrill Foundation lectures in Cleveland under the joint sponsorship of Western Reserve University and Case Institute of Technology.

Gertrud G. Edwards has been visiting lecturer in economics at Sweet Briar College in the past semester.

Denis A. Flagg has resigned from the department of economics, University of California, Berkeley, to accept a position at San Diego State College.

Edward J. Fox, of the University of Western Ontario, has been appointed visiting professor of marketing for another year in the School of Business Administration, University of Miami.

Heinrich Friedlaender, formerly professor of economics, Harpur College, State University of New York, is now consultant, Frankfurt/Main, Germany.

Eirik Furobotn has been appointed instructor in economics at Rensselaer Polytechnic Institute.

Charles C. Gersna, of the University of Michigan, has been appointed interim instructor of marketing at the University of Florida.

Frederick H. Harbison, of the University of Chicago, has accepted an appointment as professor of economics and director of the Industrial Relations Section at Princeton University effective September 1955.

George R. Hawkes has resigned as lecturer in the School of Business Administration, University of California, Los Angeles, to accept a position with the accounting firm of Price Waterhouse & Co.

Everett D. Hawkins, of Mount Holyoke College, was visiting lecturer in economics at the University of Massachusetts in the spring term.

William G. Heuson has been promoted from assistant professor to associate professor of finance in the School of Business Administration, University of Miami.

John W. Hooper has been appointed acting instructor in economics at Stanford University.

Marshall Howard, of the University of Massachusetts, has been visiting lecturer in economics at Smith College in the past academic year.

John Ise, who has been teaching economics at the University of Kansas since 1916, retires this year.

Neil H. Jacoby, who has been on leave to serve as a member of the Council of Economic Advisers to the President, has returned to his post as dean of the School of Business Administration, University of California, Los Angeles.

Myron L. Joseph has been promoted to associate professor of economics at Carnegie Institute of Technology.

Alfred E. Kahn has been promoted to professor of economics at Cornell University.

Eloise Kimmelman has been promoted from assistant professor to associate professor of accounting in the School of Business Administration, University of Miami.

E. A. Kincaid, of the University of Virginia, has been lecturer in finance at the University of Florida in the spring term.

E. R. Kuchel has been promoted from instructor to assistant professor in the department of economics of the University of Wyoming.

Leland C. Lehman, of Denison University, has accepted a research position with the Federal Reserve Bank of Minneapolis while on sabbatical leave.

Clarence D. Long has returned to Johns Hopkins University after serving with the Council of Economic Advisers as senior staff member in charge of labor matters.

Fritz Machlup, of the Johns Hopkins University, will be in Kyoto, Japan, until August where he is serving as visiting professor at Kyoto University and Doshisha University and as director of the Kyoto American Studies Seminar.

Edwin Mansfield, currently in England as a Fulbright scholar, will be assistant professor of economics next year at Carnegie Institute of Technology.

Julius Margolis has resigned from Stanford University to accept a position as lecturer in economics at the University of California, Berkeley.

Henry E. Mattox has been appointed instructor in economics at the University of Mississippi.

Alexander Melamid has been appointed assistant professor of economic and political geography in the Graduate Faculty of Political and Social Science of the New School for Social Research.

Hyman P. Minsky has been promoted to associate professor of economics at Brown University.

George Moss, who is at present on the accounting staff of the University of San Francisco, will return to the University of Miami as assistant professor of accounting in the fall.

John H. Mudie, of the University of Texas, has been appointed acting assistant professor of economics at Texas A & M College.

Eastin Nelson has been granted leave of absence from the University of Texas to accept a visiting lectureship in economics at San Carlos University, Guatemala City, Guatemala.

Ruth Bilsky Norr has been instructor in economics at Wellesley College in the second semester of the current academic year.

Robert T. Patterson, formerly of New York University, is joining the staff of Claremont Men's College as associate professor of public finance for the fall semester 1955-56.

Gaston V. Rimlinger has been appointed instructor in economics at Princeton University.

George W. Robbins has been named associate dean in the School of Business Administration, University of California, Los Angeles.

Merrill J. Roberts has been appointed professor of economics at the University of Florida.

Robert M. Robinson, of the University of California, Berkeley, has accepted a position at Sacramento State College.

Ralph L. Sackett has been appointed chairman of the department of marketing in the School of Business Administration, University of Miami.

Irving Schweiger has been appointed associate professor of business administration in the School of Business, University of Chicago.

Howard Shuman has resigned from the University of Illinois to accept a position as legislative assistant on the staff of Senator Paul H. Douglas.

Alfred G. Smith, Jr., has been promoted from associate professor to professor of economics in the department of economics at the University of South Carolina.

F. DeVere Smith has been promoted from associate professor to professor of economics in the School of Business Administration, University of South Carolina.

Victor E. Smith, of Michigan State College, has spent this year at Cambridge University as the holder of a faculty fellowship from the Fund for the Advancement of Education.

Thorn K. Snyder has resigned from Purdue University to take a position with the Arabian American Oil Company in Saudi Arabia.

Milton H. Spencer has resigned from De Paul University to accept an appointment as associate professor in the School of Business Administration at Wayne University.

Harry Stark has been promoted from lecturer to assistant professor of economics in the School of Business Administration of the University of Miami

George A. Steiner has been granted a year's leave of absence from the University of Illinois to serve as senior economic adviser in the development planning department of Lockheed Aircraft Corporation, Burbank, California.

Herbert E. Striner has resigned from the National Science Foundation as study director for industrial research to accept an appointment with the National Planning Association.

James MacD. Terrell has been appointed instructor in economics at Brown University.

Proctor Thomson, formerly of the University of Chicago, is joining the staff of Claremont Men's College as associate professor of economic education for the fall of 1955-56.

Otto von Mering has retired from the department of economics at Tufts College.

Harry I. Warner has been promoted from lecturer to assistant professor of accounting in the School of Business Administration, University of Miami

Harold L. Wattel has been granted leave from Hofstra College to serve as economic consultant to the Consumer Counsel to the Governor of New York State.

H. Lawrence Wilsey has been appointed chief of the China Division of the Foreign Operations Administration, Washington, D.C.

Alvin B. Wooten has resigned from Texas A & M College to take a position with the Texas Agricultural Extension Service.

James S. Worley has been appointed instructor in economics at Princeton University.

VACANCIES AND APPLICATIONS

The Association is glad to render service to applicants who wish to make known their availability for positions in the field of economics and to administrative officers of colleges and universities and to others who are seeking to fill vacancies.

The officers of the Association take no responsibility for making a selection among the applicants or following up the results. The Secretary's Office will merely afford a central point for clearing inquiries; and the *Review* will publish in this section brief description of vacancies announced and of applications submitted (with necessary editorial changes). Since the Association has no other way of knowing whether or not this section is performing a real service, the Secretary would appreciate receiving notification of appointments made as a result of these announcements. It is optional with those submitting such announcements to publish name and address or to use a key number. Deadlines for the four issues of the *Review* are February 1, May 1, August 1, and November 1.

Communications should be addressed to: The Secretary, American Economic Association, Northwestern University, Evanston, Illinois.

Vacancies

Private and public finance: Ph.D. with emphasis in private and public finance for a large coeducational Catholic university in the Midwest, beginning in fall, 1955. Prefer man with some institutional and some teaching experience. P170

Research in economics and investments: Large Eastern company needs a versatile research analyst to work on a wide variety of problems in an established economic-investment research unit. Requirements: At least the M.A., M.S., or M.B.A., preferably Ph.D.; good background in economics with specialization in monetary, investment, or insurance fields; the ability to write well; age not over 35; good personal appearance. This is a research position, but the man must also be able to make a favorable impression on our line executives in both written and oral presentations of his research findings. P171

International travel opportunity: The Council on Student Travel invites applications for short-term employment as educational directors on trans-Atlantic ships. Required: educators from the following fields: cultural anthropology, art history, international relations and economics, group work, language, philosophy, recreation, sociology. Conversational ability in one or more of the following: French, German, Greek, Italian. Ability to organize extensive educational program with the help of passenger volunteers. From March to December, 1955, the program will be conducted by the Council for students, tourists and migrants traveling aboard two large passenger ships belonging to one of the major lines. These ships sail regularly from New York to European and Mediterranean ports. Job assignments vary from one round-trip sailing to periods of 3-5 months. Compensation for these longer periods of service will be regular salary. For a single round-trip sailing, full or partial passage, depending upon job requirements. All positions allow for time abroad. For further information, application form, write to: Council on Student Travel, (0-1), 179 Broadway, New York 7, N.Y. REctor 2-0936.

Marketing, management, real estate: School of Business needs assistant professors in above fields, beginning September, 1955. Terminal degrees preferred. School located in Midwest. In replying, please include personal history, education, and employment experiences. P173

Economic principles and theory: Instructor or assistant professor, Catholic co-educational college in large midwestern center. Master's degree required. Salary four to five thousand, depending upon the qualifications. No objections to outside work. P174

Business administration: Instructor or assistant professor, small Catholic co-educational college in large metropolitan, midwestern center. Salary four to five thousand depending upon qualifications. Should be able to teach management and general business subjects. Ample opportunity for consultation or other outside work if desired. P175

Teaching position in economics: The University of Puerto Rico has a position available for a young man, preferably single, having at least an M.A. degree in economics. Please write to Dr. William H. Beckwith, Director, Division of General Studies, College of Agriculture and Mechanic Arts, University of Puerto Rico, Mayaguez, Puerto Rico.

Economists Available for Positions

Industrial surveys, personnel management, market research, international economics: **Man, 36, Ph.D. Extensive experience with industry, government, advertising, foreign intelligence; various teaching positions; publications; supervisory, editorial, public relations, and lecturing experience. Several foreign languages. Presently employed in New York City headquarters of an international organization. Interested in more responsible position with industrial, commercial company or large university. E450**

Business cycles, economic development, public control, transportation: Man, 35, M.A., Ph.D., University of Pennsylvania. Nine years of teaching experience at leading institutions; 5 years in industry. Broad familiarity with manufacturing and transport industries; good publication record. Desires teaching and/or research. E528

Economic principles, labor, economic thought, economic history, economic systems, corporation finance, marketing, money and banking: Man, A.M., Northwestern University, Ph.D., Yale University. Fifteen years of economics teaching experience; government experience as price economist. Broad social science background. Project in American economic field completed. Available in June or September. E536

Economic and financial history, economic theory, public finance, money and banking, labor economics, corporation finance, investments and allied subjects: Man, 40, married, Ph.D. Now teaching at large Eastern university. Interested in teaching position or perhaps a combination of teaching and some administrative work. E542

Economics of the firm, public utilities, principles, value and distribution theory, public finance, government and business, business cycles: Man, 33, married; M.A., University of Toronto, Ph.D., University of Wisconsin. Teaching since 1945; broad occupational experience, veteran, fellowships, articles in preparation. Desires teaching or position as economist for large firm. Available in June or September, 1955. E544

Public finance, price theory, national income analysis, social control, money and banking, economic principles: Man, 30, married; Ph.D., summer, 1955. Two years of experience in a large state university teaching mainly advanced courses; 2 years of experience as an economist specializing in the analysis of prices and national income for a research division of the federal government. Currently teaching. Desires teaching and/or research position. E545

Labor economics, industrial relations, economic analysis, money and banking: Man, 36, Ph.D., University of Chicago. Experience includes graduate and undergraduate teaching, top-level federal government position, university research, and industry. Interested in teaching and research. E549

Economic history, business history, insurance history: Man, 36, Ph.D., New York University. Fourteen years of governmental experience, including those of an advisory and administrative nature; 1 year of teaching experience. Has considerable counseling experience. Desires research, writing, or teaching position. Interested especially in collge or university teaching position. Of especial usefulness to life insurance companies as research assistant or historian. E553

Economics, statistics, corporation finance, investments, accounting, tax accounting, marketing: Man, 40, married; B.A., M.A., Ph.D. requirements completed except the dissertation. Ten years of teaching experience. Desires teaching or investment position. E557

Comparative economic systems, principles, corporation finance, public finance, labor, economic history, business law, constitutional law: Man, middle age; M.A., LL.B., and course requirements in economics for Ph.D. recently completed at a Big Ten university. Ten years of legal and business and 6 years of teaching experience, including 3 years at university level. Is primarily interested in the stimulating type of undergraduate teaching. Desires a teaching position. Available in June or September, 1955. E558

International trade, money and banking, investments, market research, labor economics: Man, married; Ph.D. expected this spring. Three years of university teaching numerous fields in economics; 7 years of government research experience in cost and statistical analysis, interindustry relationships, price studies, and labor relations. Interested in teaching position or opening in private industry in management, sales engineering, or foreign trade. Available immediately. E562

International trade, comparative economic systems, urban land economics, marketing, history of economic thought, public finance, money and banking, economic history of Europe: Man, Ph.D. Research fellowships; 7 years of university and college teaching; 4 years of research in federal government. Experience as consultant; multilinguist; extensive foreign travel. Desires teaching or research position. E563

Economic theory, statistics, accounting, money and banking, private and public finance, mathematical economics, international trade: Man, 35; B.S., M.A., Harvard, plus 2 years of graduate study on economic theory and statistics. Now assistant professor of economics and special lecturer of statistics; 6 years of successful college teaching experience. Other experiences include federal government position, university and industry research. Desires better teaching position or responsible statistical research position. E564

Economic history, history of economic thought, economic theory, money and banking, business cycles, international trade and economics, economic geography, corporation finance, investments, marketing: Man, 30, Ph.D., Rotterdam. Has some teaching, industrial, and marketing experience and excellent references. Desires teaching, research, or advisory position in California (San Francisco area) Arriving June, 1955. E565

Marketing research, salesmanship, retailing, business cycles, money and banking, principles of economics, principles of marketing, labor relations, personnel administration, business organization and management, American industry and economic geography, foreign trade: Man, 32, married; B.A., M.B.A., Ph.D. course and written requirements completed at New York University (Graduate School of Business Administration). President of small business 2 years; former assistant professor of economics at a large Southwestern college; 6 years of college and university teaching plus practical business background. Interested in position as teacher, in administration, or with industry. E568

Labor economics, industrial relations, advanced economic theory, monetary theory, history of economic doctrines, sociological theory, methodology: Man, 40, married, Ph.D. Twelve years of teaching experience on both the graduate and undergraduate levels; publications. Seeks teaching and/or research. Available in September, 1955. E570

Public regulation of business, public utilities, transportation, communication: Man, Ph.D. Teaching position desired in June or September, 1955. E571

Investment analysis, auditing, budgeting, business finance: Man, 51, J.D. Twelve years of experience in banking, credit and investment transactions; 5 years of experience in auditing large European organizations; 13 semesters of teaching experience as a professor in a fully accredited university in the U.S. Desires position as an investment analyst, controller, or treasurer. Also interested in teaching position. Available in June, 1955. E572

Beginning economics, economic geography, money and banking, credit, retailing, marketing, public utilities: Man, B.S., M.S., plus year of advanced study. Thirty years of experience in teaching and research work; 28 years of teaching in one institution. Being retired under faculty service ruling. Available for part-time, visiting, or supply instructor. Available in July or September. E573

Economic principles, money and banking, public finance, corporation finance, investments, business cycles, international economics: Man, 37, single; B.S., M.A., requirements for Ph.D. completed and dissertation in progress. Ten years of business experience in commercial banking and insurance underwriting; 2 years of teaching experience at outstanding midwestern schools; currently chairman of department of economics and business at a leading midwestern college. Desires a change to a better position offering greater opportunities for research and development. Stimulating teacher and public speaker. Partial to Southwest (Arizona) or West Coast location. Available in June, 1955. E574

Economics of Far East, underdeveloped areas, international trade, money and banking, principles, price and income theory, cycles: Man, 32, married; Ph.D. dissertation in progress. Eight years of teaching experience at state universities; 2 years as chief economist, stabilization agency; publications; journalistic background. Now teachng, but welcomes participation in research, teaching, or combination program with attention to Far East and underdeveloped economies. Available on short notice. E575

Business research: Man, 43, married; Ph.D. Industrial and university experience; publications; national convention speaker. Background in statistics, finance, economics, and business administration. Seeks either full-time research or research combined with teaching. E576

Principles, corporation finance, investments, money and banking, American economic history: Man, 56, married. Retired as officer of leading New York bank after 35 years of experience in investments and corporation finance; now completing studies for Ph.D. at Columbia University. Some teaching experience; extensive foreign travel; French and other languages. Desires fall-term teaching position. E577

Economic theory, international trade, marketing, comparative economic systems, public finance, investments, corporation finance: Man, 42; Ph.D. Wide experience in teaching, high-level government service, and private industry. Interested in teaching, research and/or administration. E578

Economic principles, comparative economic systems, labor, economic thought, economic history, corporation finance, money and banking: Man, 29, married; Ph.D. course requirements completed. Two years of research experience; 2 years of teaching; now teaching in midwestern college; several European languages. Available in June or September, 1955. E579

Economic theory and principles, history of thought, public and private finance, and other subjects: Man, under 40, prewar Ph.D. Experience in banking, research, government service. Taught 17 years at every level through Ph.D. program, including most fields in economics and business curriculum, specializing in economic theory; past 7 years at large state university, with permanent tenure. Original contributions to scholarly and popular journals in economic theory, finance, and other fields; pioneering book to be published this summer; three others, including textbook, in progress. Minimum: full professorship. Please state salary. Available immediately. E580

Economics, business administration: Man, 51, married; B.S., M.A., near Ph.D., Chicago. Nineteen years of university and college teaching, much of the time as head of departments of economics and business administration; 5 years of responsible government work as economist, business analyst, or administrative assistant. Wide business experience, selling, sales management, accounting and tax fields; now associate professor of management, California college. Primarily interested in teaching position West or Northwest (preferred). Available in June or September, 1955. E581



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BERNARD F. HALEY, Managing Editor
DORIS MERRIAM, Assistant

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ARTICLES

REVIEW ARTICLES

COMMUNICATIONS

BOOK REVIEWS

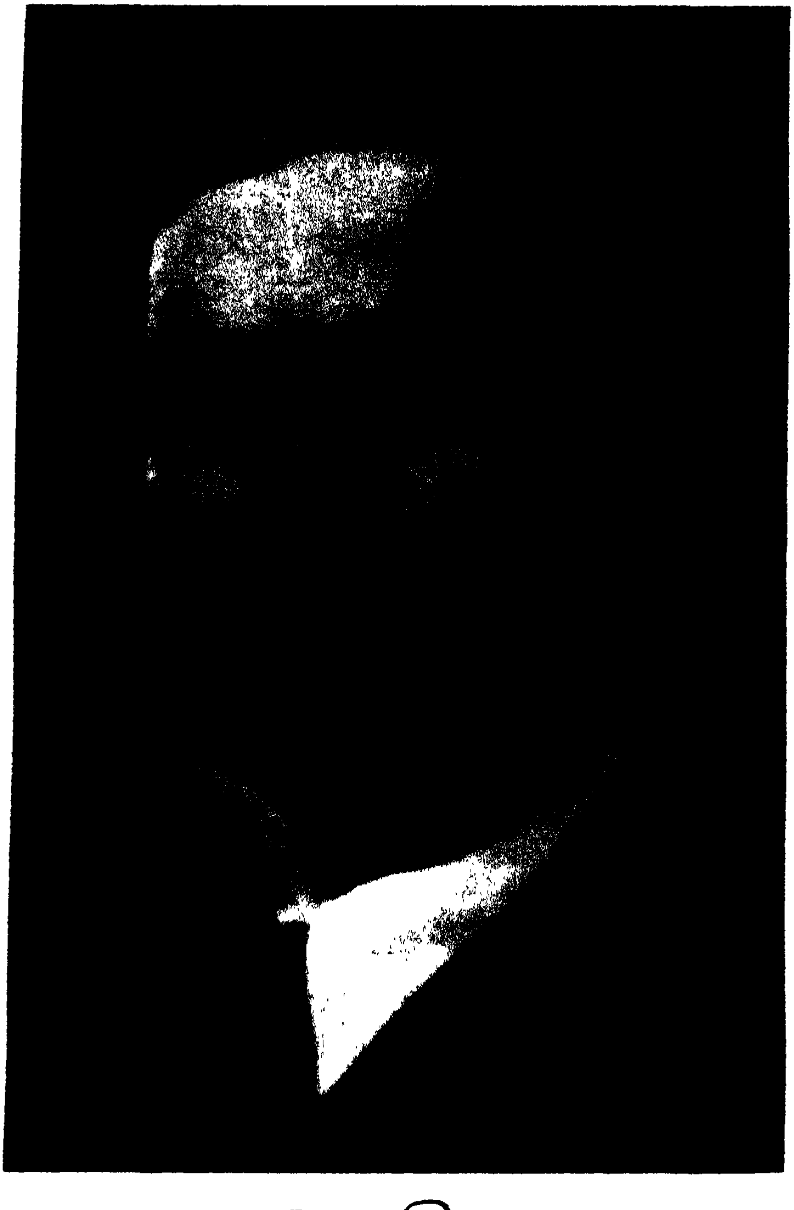
Manuscripts and editorial correspondence relating to the regular quarterly issues of this REVIEW should be addressed to Bernard F. Haley, Managing Editor of THE AMERICAN ECONOMIC REVIEW, Stanford University, Stanford, California. *Style Instructions* for guidance in preparing manuscripts in acceptable form will be provided upon request to the editor.

OTHER DEPARTMENTS

EDWARD ALSWORTH ROSS

Secretary of the American Economic Association, 1893

Edward Alsworth Ross was born at Virden, Illinois, on December 12, 1866. He died at Madison, Wisconsin, July 22, 1951. He was left an orphan at the age of eight. At fifteen, he entered the preparatory school of Coe College, Cedar Rapids, Iowa, was graduated from this College in 1886 (LL.D., 1911). After teaching school for two years, he went to Germany, spending a year at the University of Berlin. His next three years were spent at Johns Hopkins University, where he received his Ph.D. degree, with a major in economics and minors in philosophy and ethics. Thereafter he became a member of the faculty of Indiana University for a year, then another year at Cornell University, then seven years at Stanford. This was followed with a five-year professorship at the University of Nebraska. From there he was called to the University of Wisconsin in 1906, where he stayed until his retirement in 1937. It was here that he wrote most of his books and articles on sociology and became recognized as one of the pioneers in that field. He was one of the four sociologists to be elected for two successive terms as president of the American Sociological Society, 1914-15. Ross was elected Secretary at the annual meeting held August 23-26, 1892, at Chautauqua, New York. He was elected to succeed Richard T. Ely, who was at that time moving to the University of Wisconsin and who had delegated most of the secretarial work to Frederick C. Howe, acting as Assistant Secretary. Ross had moved from Johns Hopkins University to Cornell. In September, 1893, he wrote to Jeremiah W. Jenks from Stanford University that owing to illness, he was not able to formulate his Secretary's report and that he "was only too anxious to get rid of the burden of duties and responsibilities which though not heavy in themselves felt rather heavy to [him] then."



E. A. Ross

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FINANCIAL ASPECTS OF ECONOMIC DEVELOPMENT

By JOHN G. GURLEY AND E. S. SHAW*

Economic development is commonly discussed in terms of wealth, the labor force, output, and income. These real or "goods" aspects of development have been the center of attention in economic literature to the comparative neglect of financial aspects. Yet development is associated with debt issue at some points in the economic system and corresponding accretions of financial assets elsewhere. It is accompanied, too, by the "institutionalization of saving and investment" that diversifies channels for the flow of loanable funds and multiplies varieties of financial claims. Development also implies, as cause or effect, change in market prices of financial claims and in other terms of trading in loanable funds. Development involves finance as well as goods.

In the first section below we review briefly the financial manifestations of income generation, spending and saving, investment, and the accumulation of wealth. The second section is concerned with the role of financial institutions or intermediaries in transmitting loanable funds between spending units. The third section suggests that conventional theories of income, interest, and money have given insufficient attention to important reciprocal relationships between real development and financial development, and proposes some theoretical adaptations. The final section is concerned with illustrative implications of our analysis for some aspects, especially the monetary, of economic policy and regulatory techniques.

I. *Finance in the Social Accounts*

Analysis of economic change and development has customarily relied on an abbreviated set of social accounts. This set of accounts reports

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the net worth items of income, consumption, and saving as well as the asset item of investment or wealth accumulation. The accounts omit the financial side of change and development, that is the accumulation of debt and financial assets in their various forms. They are not a complete social balance sheet. One result is that financial analysis, left to its own devices, has been difficult to coordinate with analysis "on the side of goods." Another result, we suspect, is an inadvertent undervaluation by economists of the role that finance plays in determining the pace and pattern of growth.

A. *Deficits, Surpluses, and Balanced Budgets*. It is not difficult, in principle, to design a set of social accounts that does incorporate finance. Final buyers of output, or spending units, may be divided into three groups:

Spending units with *balanced budgets* keep their spending—on consumption, investment, or government goods and services—precisely in balance with income. If they save, they invest a like amount, so that their financial assets do not change relative to outstanding debt including equity claims other than earned surplus.[1] Spending units with *surplus budgets* have an excess of income over spending on goods and services. If they save, their saving exceeds their own investment, so that their financial position improves. Their financial assets increase more or decrease less than their liabilities, and they are thereby suppliers of loanable funds. Spending units with *deficit budgets* permit spending to exceed income.[2] They demand loanable funds, releasing financial assets or issuing debt, so that their financial assets decline relative to the sum of their liabilities and equity other than earned surplus. A complete set of social accounts would report the flows of loanable funds between spending units and the corresponding changes in financial status.[3]

There are financial corollaries following from the *ex-post* identity of receipts and expenditures, of saving and investment, and of surpluses and deficits for the aggregate of spending units. First, loanable funds supplied equal loanable funds acquired. Second, the increase of net

[1] By "debt" and "liability" we mean both the creditor claims and the equity claims that are instrumentalities of external financing.

[2] In 1939 Walter S. Salant proposed that spending units be classified as we propose, so that real change could be explicitly related to financial change. National Bureau of Economic Research, *Studies in Income and Wealth*, Vol. III (New York, 1939), pp. 305-11. Mr. Salant has been most helpful in discussions of this article, but no guilt attaches to him for the consequences.

[3] It may be helpful if our definitions are put more succinctly. Let R be receipts on income account, E expenditures on income account, D any increment in debt, and FA any increment in financial assets. Subscripts b, s, and d refer to type of spending unit (balanced-budget, surplus-budget, and deficit-budget). Then, for any spending unit:

$$E - R = D - FA$$

financial assets for surplus spending units equals the increase of net financial liabilities for deficit spending units. The rise of income and the accumulation of wealth are one aspect of growth: the corollary, where budgets are unbalanced, is the accumulation of debt and financial assets.[4]

An *ex-ante* balance between income and spending, saving and investment, and surpluses and deficits implies *ex-ante* balance between offers of and bids for loanable funds, offers of and bids for financial assets, willingness to incur debt and willingness to hold debt instruments. An equilibrium level of income and wealth is associated with an equilibrium level of debt and its counterpart in financial assets.

B. *Relative Change in Debt, Income, and Wealth.* Accumulation of debt is part of the growth process, but the rate of accumulation is not related by a simple constant to the rise of wealth and income.[5] The proportion of the stock of debt to a community's income appears to depend on three complex factors: (1) the ratio of borrowing to deficits; (2) the ratio of deficits to income; (3) and the rate of change in income. To the degree that the income-wealth ratio is stable, the proportion of the stock of debt to community wealth depends on these same factors. Any variation in the income-wealth ratio becomes a fourth factor affecting the debt-wealth relationship.

The ratio of borrowing to deficits is affected by the manner in which deficits are financed, as we shall see in the next section. It is affected, too, by the desire of spending units to incur debt for other purposes than finance of deficits. These purposes may include acquisition of claims on banks and other financial intermediaries, of claims that give managerial control over other spending units, or of claims that have speculative interest.

The ratio of deficits to income depends in part on such institutional factors as the chronic concentration of investment in some sectors, say

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Spending units may be classified as follows:

Balanced-budget	$D_b = FA_b$
Surplus-budget	$D_s < FA_s$
Deficit-budget	$D_d > FA_d$

The flow of loanable funds is $FA_s - D_s = D_d - FA_d$

[4] We neglect various complexities in accounting for finance. For example, we overlook nonuniformity in accounting practices and the resulting imbalance between the records of debtors and creditors. We omit, too, the possibility of transfers of existing real assets, rather than securities, between deficit spending units and surplus spending units.

[5] A particularly helpful discussion of wealth-debt relationships may be found in R. W. Goldsmith, *Financial Structure and Economic Growth in "Advanced" Countries*, (mimeo.), a paper presented to the Conference on Capital Formation and Economic Growth, National Bureau of Economic Research (New York, 1953).

the corporate, and of saving in others, such as the personal sector. Institutional or technical factors that alter the division of labor between savers and investors must affect the proportion of debt to income and wealth. The ratio of deficits to income evidently depends, too, on disturbances in the propensity to spend, by spending units with access to borrowing facilities, on goods regarded by creditors as a suitable basis for lending.

However stable may be the proportion of borrowing to income in any period, the proportion of accumulated debt to income depends on how rapidly income is growing. It is relatively low if income is gaining swiftly, high if income growth is sluggish. The stock of debt changes slowly enough so that variations in the growth rate of income can significantly affect the debt-income relationship.

Whatever the ratio of debt to income, the ratio of debt to wealth reflects variations in the income-wealth ratio. These variations may occur for any of several reasons. For example, income and debt may rise on a wave of spending that does not result forthwith in capital formation.[6] Again, technological factors may alter the capital coefficient at full employment of productive capacity. Or, because of variations in effective demand, productive capacity may be exploited more or less intensively.

II. *Finance and Financial Intermediaries*

A. *Self-Finance, Direct Finance, and Indirect Finance.* Expenditure is self-financed by spending units with balanced budgets. Their consumption is financed from income, their investment from internal savings. If their financial assets and debt do change, the changes are equal. Self-finance continues to be important in the most sophisticated economic system, say in the form of investment out of retained corporate earnings. But over the very long term, the trend has been away from self-finance. Government, business, and consumers alike have come to lean more heavily on external finance.

External finance may take either of two forms, direct finance or indirect finance. Direct finance involves borrowing by deficit spending units from surplus spending units. The former issue debt of their own, *direct* debt. The latter buy and hold financial assets in the form of these direct securities. If spending on capital formation is directly financed, debt tends to accumulate *pari passu* with wealth.

Economic development is retarded if only self-finance and direct

[6] Debt to finance exhaustive spending is sometimes called "dead-weight" debt. We have avoided this term because it suggests, improperly in our view, that such debt is necessarily obstructive in the growth process in contrast with debt that finances expansion of productive capacity.

finance are accessible, if financial intermediaries do not evolve. The primary function of intermediaries is to issue debt of their own, *indirect* debt, in soliciting loanable funds from surplus spending units, and to allocate these loanable funds among deficit units whose direct debt they absorb.

When intermediaries intervene in the flow of loanable funds, the accumulation of financial assets by surplus spending units continues to equal the accumulation of debt by deficit units. The rise of intermediaries—of institutional savers and investors—does not affect at all the basic equalities in a complete social accounting system between budgetary deficits and surpluses, purchases and sales of loanable funds, or accumulation of financial assets and debt. But total debt, including both the direct debt that intermediaries buy and the indirect debt of their own that they issue, rises at a faster pace relative to income and wealth than when finance is either direct or arranged internally. Institutionalization of saving and investment quickens the growth rate of debt relative to the growth rates of income and wealth.[7]

B. *Commercial Banks and Competitive Intermediaries.* A monetary system, and especially its commercial banking component, has commonly been the first significant financial intermediary to complicate the simplicity of self-finance and direct finance. Even as late as a half-century ago in this country, the commercial banks offered the predominant escape from self-finance and direct finance.

The role of the banks has been, first, to borrow loanable funds from spending units with surpluses, issuing indirect securities in exchange. These securities have been the currency and deposits that spending

[7] In terms of definitions in note 3 above: Total expenditures (E) = Total finance $(R + D - FA)$ Then self-finance is $R - FA$ and external finance is D, which may be rewritten as D^p to distinguish the debt of spending units from D^i, the debt, aside from equity claims, of financial intermediaries. D^p is direct debt, while D^i is indirect debt. Financial assets, too, may be classified into FA^p, balances in the form of direct debt issued by other spending units, and FA^i or balances in the form of nonequity claims on financial intermediaries. Assuming that no borrowing is done simply to finance accumulation of financial assets, we may describe direct finance in this fashion:

For surplus units	FA_s^p = budget surplus
For deficit units	D_d^p = budget deficit
For all units combined	$FA_s^p = D_d^p$ = budget deficit

And the description of indirect finance is:

For surplus units	FA_s^i = budget surplus
For deficit units	D_d^p = budget deficit
For financial intermediaries	$FA_f^p = D_f^i$
For all units combined	$D_d^p + D_f^i = FA_f^p + FA_s^i = 2$ (budget deficit)

In the latter case, total debt rises twice as rapidly as cumulative deficits or surpluses. This case, of course, is a very simple one, and the multiplicative factor of 2 is only illustrative.

units would prefer over real assets or the direct security issues of ultimate borrowers. The role of the banks has been, second, to transmit the borrowed funds to spending units with deficits, receiving in exchange direct securities for their own portfolios. Finally, the banks have exchanged direct securities with spending units that wish to adjust their relative holdings of securities in direct and indirect form.

When banks are the only intermediary, surplus spending units may choose to accumulate real wealth, direct securities, or deposits and currency. Deficit spending units may finance themselves by retained earnings, by issues of direct securities to surplus units, or by issues of direct securities to banks. The degree to which debt is absorbed by banks, and, hence, the degree to which financial-asset accumulation is in deposit or currency form expresses the preference of spending units for the asset that is fixed in price (as distinct from value).

Before financial intermediaries other than the monetary system assume importance, monetary theory in the sense of theory about the supplying of and the demand for money relative to the supplying of and demand for direct securities ("bonds") is a perfect balance-sheet counterpart for income theory, saving-investment theory, or surplus-deficit analysis. In so simple a financial system the disposition of surpluses and deficits is accounted for completely by accumulation of direct debt and of indirect debt in money form. Economic theory can appropriately limit its attention to goods, bonds, and money as long as the institutionalization of saving and investment is confined to the monetary system.

In this country, especially since 1900, the innovation and growth of other financial intermediaries have greatly diversified the channels through which loanable funds can flow, the types of financial assets that surplus units may acquire, and the markets on which deficit spending units may sell direct securities. Prior to 1900 the commercial banks shared the field of intermediation with mutual savings banks, savings and loan associations, insurance companies, and a few lesser competitors. To these competitors have been added, since 1900, the Federal Reserve banks, public and private pension funds, governmental insurance and lending agencies, postal savings, credit unions, private investment companies and others. Each of these intermediaries issues its distinctive form of indirect debt—for example, savings deposits, savings and loan shares, pension claims—and thus provides a distinctive package of financial services as a financial asset for spending units to accumulate in substitution for direct debt or money. They compete among themselves, with banks, and with direct finance, for the direct securities that emerge from deficit units. Institutionalization of saving and investment has amounted to differentiation of product in the field of finance.

How nonmonetary financial intermediaries fit into a complete set of social accounts is clear. In the process of economic change and development spending units with surpluses accumulate financial assets, direct and indirect, with the indirect assets taking more variegated form. Spending units with deficits accumulate indebtedness, with the debt outstanding to more diversified bodies of creditors. Aggregate debt rises at a faster pace relative to wealth if deficits and surpluses rise relative to income, if income rises relative to wealth, and if an increasing proportion of direct debt moves into the portfolios of financial intermediaries.

The familiar trichotomy in theory of goods, bonds, and money does scant justice to this complex pattern of real and financial change. By implication financial intermediaries other than the monetary system are netted out of the social accounts, their holdings of direct debt attributed to their creditors.[8] We argue that any domestic debt can be netted out—direct debt and money too—if one pursues far enough the doctrine that "after all we owe the debt to ourselves." We will argue in the next section that elimination from the social accounts or from economic reasoning of any significant body of debt conceals determinants of economic behavior on the part of spending units.

We are deviating from conventional doctrine in regarding the banking system as one among many financial intermediaries, sharing with the others the functions of indirect finance. We take exception to the view that banks stand apart in their ability to create loanable funds out of hand, while other intermediaries in contrast are busy with the modest brokerage function of transmitting loanable funds that are somehow generated elsewhere.

Neither banks nor other intermediaries create loanable funds. That is the prerogative of spending units with surpluses on income and product account. Both banks and other intermediaries have the capacity to create special forms of financial assets that surplus units may accumulate as the reward for restraint on current or capital spending. Banks alone have the capacity to create demand deposits and currency, to be sure, but only savings and loan associations can create savings and loan shares: both "create credit," both transmit loanable funds, both enable spending units to diversify their portfolios.

Banks do have a virtual monopoly of the payments mechanism, and only claims upon monetary intermediaries embody the privilege to use this mechanism. The fact that other intermediaries make use of the payments mechanism, which the banks administer, has sometimes been

[8] Even the monetary accounts are too rarely retained explicitly in the accounts. For an unusual and interesting experiment in keeping the income accounts and monetary accounts together see Henry K. Heuser, "Recent Financial Changes in Western Germany," *Fed. Res. Bull.*, Oct. 1954, XL, 1041-50.

interpreted to mean that other intermediaries have the inferior role of brokerage in loanable funds while the banks have the superior role of creation of loanable funds. Both types of institution, on the contrary, are loanable-fund brokers. Both create credit. Whether it is the banks or others which create credit in any period depends not on the banks' role in administering the payments machinery but instead on the preference of spending units for deposits and currency to hold as against other financial assets to hold.

C. *Financial Trends in the United States.* Table I itemizes some rough measures of change over the past half-century in this country's aggregate debt structure. National financial assets have risen by half again as much as wealth. Financial assets owned by intermediaries, in turn, have risen by half again as much as national financial assets: indirect debt has been a growing proportion of total debt. Self-finance and direct finance have accounted for a diminishing proportion of flows of loanable funds.

TABLE I—ACCUMULATION OF FINANCIAL ASSETS, 1900–1949[a]
(percentages)

	1900	1929	1949
Proportion of:			
1. National financial assets to national wealth	82.1	123.2	124.9
2. Financial assets of financial intermediaries to national financial assets	25.5	28.6	38.5
3. Financial assets of commercial banks to national financial assets	13.9	12.2	14.0
4. Financial assets of commercial banks to financial assets of all other financial intermediaries	119.7	75.0	57.3
5. Financial assets of commercial banks to financial assets of other private financial intermediaries[b]	120.5	83.7	94.7
6. Financial assets of commercial banks to national wealth	11.4	15.1	17.5
7. Financial assets of commercial banks to gross national product	53.9	63.8	60.1
8. *Money supply to financial assets of financial intermediaries other than commercial banks and Federal Reserve banks*[c]	66.5	31.9	16.8

[a] R. W. Goldsmith, *The Share of Financial Intermediaries in National Wealth and National Assets, 1900–1949*, p. 97. Data from this source have been adjusted in Table I for improved estimates that Goldsmith will publish in subsequent studies.

[b] "Other private financial intermediaries" exclude Federal Reserve banks, government lending institutions, government insurance and pension funds.

[c] The money supply in this case includes adjusted demand deposits and currency outside banks.

The commercial banks' share of all securities has been nearly constant, in the range of 12-14 per cent. But the proportion of their holdings to those of other intermediaries fell by more than half in 1900-1949, from 119.7 per cent to 57.3 per cent. Their relative participation in indirect financing has declined. As comparison between items (3)

and (5) in Table I indicates, a little less than half of their loss in status can be traced to the rise of the Federal Reserve and of government financial institutions, while a little more than half is attributable to gains made by financial intermediaries of a private character. The commercial banks have grown at a faster pace than national wealth and national income, but they have lagged behind the pace of general financial development. To a smaller degree, as item (8) suggests, creation of money by the monetary system as a whole has lagged behind creation of indirect financial claims by other financial intermediaries.[9]

III. *Output Growth, Interest, and Finance*

For nearly two decades analysis of income, interest, and money has conformed to the Keynesian model. This model is not an efficient instrument for studying economic development in either its real or its financial aspects. On the side of goods, the model is inefficient because it does not allow for the effects of investment and of growth in the labor supply on output capacity. Once these effects are admitted, as in the Harrod and Domar growth models, investment appears in a dual role. As an element in effective demand, it is an economic stimulant, but as an increment in capacity its effects may be depressing.

On the side of finance, the Keynesian model is inefficient because it does not allow for the effects of spending and deficits on debt and on financial capacity of spending units to sustain their spending. Deficits, like investment, leave an economic residue. In the case of investment, the residue is output capacity. In the case of deficits, the residue is debt and a change in financial capacity.

A. *The Liquidity-Preference Model.* The Keynesian or liquidity-preference model embraces so short a time period that current expenditures, including investment, cannot lead to an increase of wealth or of direct debt.[10] The model appears to exclude borrowing, so that loanable funds cannot flow and cannot affect the rate of interest. However, in

[9] For an exhaustive listing of financial intermediaries, the reader is referred to various writings of R. W Goldsmith. These include: *The Share of Financial Intermediaries in National Wealth and National Assets, 1900-1949*, National Bureau of Economic Research, Occas Paper 42 (New York, 1954); *Financial Structure and Economic Growth in "Advanced" Countries, op. cit.; A Study of Saving in the United States* (Princeton, 1955)

Goldsmith has classified intermediaries as follows: (1) The banking system (Federal Reserve banks, commercial banks, savings banks, the Postal Savings system); (2) Other depository organizations (saving and loan associations, credit unions); (3) Insurance organizations (private life insurance, private pension funds, government insurance and pension funds, property insurance companies); (4) Other financial intermediaries (investment companies, Land Banks, mortgage companies, finance companies, security brokers and dealers, government lending institutions, personal trust departments, commercial paper and discount houses, acceptance dealers, foundations, title guaranty companies).

[10] Short-period, self-liquidating "finance" was an afterthought which Keynes apparently did not regard as a deviation from the initial form of his model. It was a temporary rise in direct debt, shortly to be liquidated.

Keynesian dogma, the rate of interest does depend on *past* flows of loanable funds though it does not depend on current flows. Past flows have left the heritage of a stock of direct debt or bonds. The distribution of past flows between direct channels of finance and one indirect channel, the monetary system, has affected the allocation of bonds between spending units and the monetary system, and as a result, the proportion of bonds to money in the portfolios of spending units.

Though the stock of bonds cannot rise in the Keynesian short period, the historic distribution of bonds can be changed, according to the dictates of monetary policy, by monetary techniques. The function of monetary techniques is, in fact, to transfer bonds between the banking system and spending units and, if fortune smiles upon the authorities, to change in the desired direction the marginal rate of preference by spending units for bonds against money.

To the degree that bonds are held by banks, spending units hold money created by the banks. An ample supply of money implies in the Keynesian model that the taste for liquidity is relatively sated.[11] With bonds in short supply to spending units, the taste for interest is relatively unsated, and the price of bonds in terms of money is high. If bonds are held not by banks but by the public, money and liquidity are in short supply. Then the taste for interest income is relatively sated, bond prices are low in terms of money, and the interest rate is high.

Given factors that affect the intensity of demand for liquidity and money—income, speculative anticipations, and precautionary needs—the price of bonds depends on where bonds are, whether in the portfolios of banks or in the portfolios of spending units. In static equilibrium, the distribution of bonds must yield that rate of interest at which, given the level of income, *ex-ante* surpluses and deficits are equal and spending units are content with the division of their financial assets between bonds and money.

This Keynesian model is inappropriate to financial aspects of growth analysis for two reasons. First, it does not permit direct debt to accumulate and affect financial determinants of spending. Second, it admits only two kinds of financial asset, money and bonds, on the assumption that the stock though not the location of bonds is fixed. The model is not hospitable to the financial intermediaries whose development in recent decades has diversified indirect finance and marked commercial banking as a relatively declining industry. Briefly, the financial aspects of the Keynesian model ignore the long-period ac-

[11] Keynes, it will be remembered, had his doubts about equating money and liquidity if money is defined in some narrow way. See, *General Theory of Employment Interest and Money*, p. 167.

cumulation of securities and the secular institutionalization of saving and investment.

B. *Debt Accumulation and Interest Rates.* The Keynesian model may be adapted, first, by extending the time period to permit loanable funds to flow and debt to accumulate. We may continue to suppose, for the time being, that debt and financial assets consist of bonds and money. The revised model needs to be a dynamic one in which divergent rates of growth in wealth, income, and debt influence the willingness of spending units to incur deficits and debt and to accumulate financial assets.

Suppose, for the moment, a given level of national income and of demand for transactions balances of liquidity.[12] Suppose, also, a given disposition on the part of spending units to incur deficits and to finance them by borrowing. Then, if loanable funds take only the direct route with none flowing through the banking system—if the supply of money is fixed— accumulating bonds accrue to surplus spending units, and deficit units incur an increasing bulk of debt. The effect on both types of spending unit may well be such as to disturb an initial aggregative equilibrium.

The portfolios of surplus spending units deteriorate, as bonds or illiquid assets gain relative to liquidity in money form. This decline in the liquidity index of their portfolios may induce surplus units to express a *diversification demand* for additional money balances that does not depend on the speculative and precautionary considerations of Keynesian short-run liquidity preference. With the supply of money given, the diversification demand may bring about a rise in interest rates that can depress national income below its initial level.

Surplus units, then, may absorb an increasing stock of bonds only at a rising discount. Meanwhile, the propensity of deficit units to spend may decline as debt accumulates over a succession of periods and as debt charges gain on income. A fall in interest rates, or a general easing in credit conditions, may be needed to prevent suppression of spending. A growing disinclination on the part of deficit units to issue debt at given interest rates may accompany the rising diversification demand for money relative to bonds on the part of surplus units.

Because of debt accumulation, equilibrium at the given level of income is threatened. Just as investment may add to output capacity and so jeopardize the level of national income, the issue of debt through the

[12] Our purpose, in assuming national income constant at the first step of the analysis, is to isolate the accumulation of debt as an independent determinant of the demand for money or its substitutes. Debt can and does accumulate even when income is falling as well as when it is constant or rising. So a monetary authority cannot safely adopt the rule that demand for money increases only as income grows—or only as conventional speculative demand rises.

channels of direct finance may have its deflationary impact through the responses of both deficit and surplus units.[13]

To protect the processes of growth from this deflationary impulse, the monetary authority would need to permit an expansion of the money supply. It would recurrently ease the position of banks so that some increasing share of loan funds would flow indirectly, and so that money would be sufficiently plentiful in the total of financial assets to maintain or even reduce the level of interest rates. For the ease of mind of the economy, the monetary authority should announce that it would underwrite expansion of the money supply at the annual rate of x per cent even if national income were to remain constant. If the authority did not act, deficit spending units would be forced into direct finance and ultimately to self-finance on a falling level of national income.

The optimal rate of increase in the money supply, at a given level of income, would vary according to the illiquidity of bonds that the banks would buy. The rate could be relatively low if the banks were, for example, to lend long and leave to the public the more liquid short-term assets. The rate would be high if the public were left with a scant supply of more or less close substitutes for money. The optimal growth in the money stock, at a given level of income, depends then on the accumulation of debt, the effect of indebtedness on deficit spending, the asset preferences of surplus units, the maturity structure of the debt and its other qualities, and the character of the banking system's portfolio.

If income rises, too, along with output capacity and debt, the pressure on interest rates is even more emphatic. The rise in income intensifies the transactions demand for liquid balances. If steady growth in output requires stability in interest rates and other terms of lending, monetary policy must induce expansion in the money supply to satisfy the diversification and transactions demands for money that result from rising debt and rising income. The banking system must be permitted to grow so that the portfolios of surplus units will not be oversupplied with bonds and undersupplied with money.

How fast the money supply must rise, to stabilize terms of lending when income is rising, depends partly on the rate of increase in income. Evidently the money supply must keep in step with demand for money balances. The diversification demand depends on the stock of debt, which falls in proportion to income the more rapidly income gains. While the diversification demand may become smaller in proportion to income, as the pace of growth in income increases, the transaction demand may grow proportionally with income. The sum of these demands,

[13] Joan Robinson, "The Concept of Hoarding," *Econ. Jour.*, June 1938, XLVIII, 235.

then, lags behind income as income gains at a faster pace. It follows that the ratio of increments in the money supply to increments in the income level can be reduced as income gains at a faster pace. The marginal velocity of money may rise, without strain on credit conditions, if income is sufficiently buoyant.[14]

C. *Interest Rates, Money, and Other Financial Assets.* In the standard model the rate of interest depends on the proportional allocation of bonds between spending units and the financial institutions that create credit in the form of money, or "pure" liquidity, for spending units to hold as a substitute for bonds. In so rigid a form, nonbank financial intermediaries are neglected. There have been desultory efforts to correct this rigidity.[15] The definition of money has been widened at times to include time deposits, and the point is sometimes made that still other financial assets have the quality of liquidity only a little diluted. They, too, it is implied, should be added to the liquid things that the public may choose over bonds, and the institutions that issue them should somehow be attached peripherally to the monetary system. Then, presumably, the rate of interest can depend on the distribution of bonds between the public and this expanded "monetary" system.

A more decisive break with liquidity-preference theory seems advisable. Liquidity is not the only characteristic that distinguishes bonds from alternative financial assets. Each financial intermediary offers its own differentiated product for the public to hold. This product is competitive with bonds. It may be more or less liquid than bonds, but it embodies a service, perhaps insurance, that bonds do not. The product is also competitive with money narrowly defined, offering less in liquidity perhaps but offering as well security, interest, insurance, and other services. In view of the increasing variety of financial assets, it does seem appropriate to abandon liquidity as the pivotal factor in

[14] Suppose that spending units issue debt in a proportion of their deficits which, in turn, are b proportion of national income Y. For present purposes, we may assume ab is constant. The issue of direct debt in any period is abY. Spending units may choose, at given interest rates, to hold only e proportion of direct debt issues abY, and may express an incremental diversification demand for money balances of $(1-e)\ abY$. Incremental transaction demand for money balances is $t\,\Delta Y$, so that total incremental demand for money is $(1-e)\ abY + t\,\Delta Y$. Equilibrium requires that the increase in the money supply ΔM should equal demand:

$$(1)\quad \Delta M = (1-e)\ abY + t\,\Delta Y$$

Dividing by ΔY, it follows that:

$$(2)\quad \frac{\Delta M}{\Delta Y} = (1-e)\ ab\frac{Y}{\Delta Y} + t$$

Hence, the higher ΔY for a given Y, the lower may be ΔM for a given ΔY and the higher may be marginal velocity or $\Delta Y/\Delta M$

[15] John Lintner, "The Theory of Money and Prices," *The New Economics*, ed. by Seymour E. Harris (New York, 1947), pp. 516-23.

interest theory. The price of bonds, we may say, depends on where the bonds are and on the pattern of preference among spending units for the increasingly rich and variegated menu of financial services attached to financial assets.

A simple exercise in short-period static analysis may suggest the effects of bringing these other financial assets than bonds and money into interest theory. We suppose that the availability of these financial assets does not affect the propensity of spending units to spend on output. The period we consider is Keynesian, and the supply of money and direct bonds is given. In one static position, only bonds and money are available and demanded, and an interest rate is determined. In the comparative position, other financial assets may be supplied and demanded. The difference between interest rates on direct bonds, in these comparative positions, depends in general on the degree to which the other financial assets are substitutes for bonds or substitutes for money.

We assume that supply of the nonmonetary indirect financial assets is infinitely elastic, and that the demand by spending units for these assets brings about a roughly equivalent demand for bonds by nonbank intermediaries. If these other assets are substitutes for the given stock of money in the portfolios of spending units, a demand for them brings nonbank intermediaries to the bond market to compete for bonds with spending units. Then the price of bonds must be higher and the interest rate lower than when banks are the sole intermediaries. The price of bonds rises because the total demand for bonds exceeds the fixed supply at the price which would prevail if only bonds and money were supplied and demanded, or because the demand for money by spending units falls short of the fixed supply at the interest rate that would be appropriate if only bonds and money were available.

If, on the other hand, nonmonetary indirect financial assets are substitutes for bonds in the portfolios of spending units, the price of bonds may be the same in our two static cases. In this situation, the demand for bonds by nonbank financial intermediaries displaces demand by spending units. If nonmonetary indirect financial assets, finally, are substitutes for both bonds and money, their effect must be a fall in the interest rate of smaller magnitude than we expect when only the demand for money is affected.[18]

D. *Suggestions for a Financial Theory of Growth.* A theory of interest and income which allows for accumulation of debt and for the

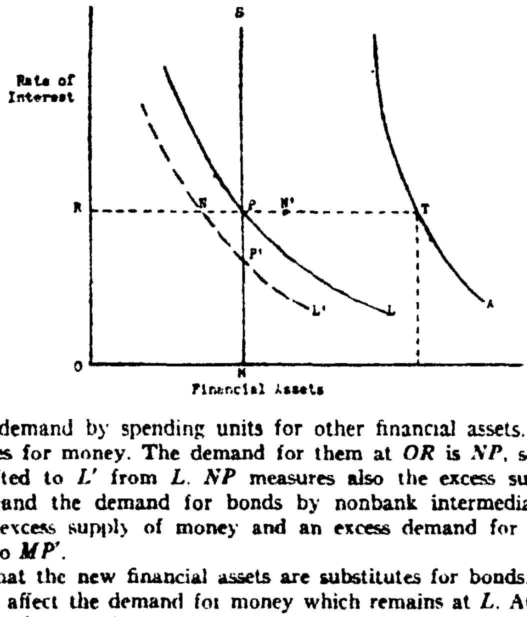
[18] The analysis in the text may be illustrated by a diagram adapted from Lerner. In the diagram L is the demand for money, and S is the supply of money. A is total financial assets of spending units, increasing as the value of the fixed stock of bonds rises with falling interest rates. The horizontal distance, at any interest rate, between L and A is the

growth of nonmonetary financial intermediaries is a more useful tool than short-period liquidity-preference theory for analysis of economic development. Such analysis of development on the side of finance should, of course, be integrated with analysis of development in real terms.

The investment component of national income, together with growth in the labor supply, raises output capacity. Given the consumption function, investment must rise, from period to period, to generate the

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demand for bonds. The horizontal distance, at any interest rate, between S and A is the supply of bonds. The equilibrium rate of interest is OR, because at that rate there is equality between supply and demand for both money and bonds.



Assume now a demand by spending units for other financial assets. Assume, too, that they are substitutes for money. The demand for them at OR is NP, so that the demand for money is shifted to L' from L. NP measures also the excess supply of money at interest rate OR and the demand for bonds by nonbank intermediaries. Since at OR there is both an excess supply of money and an excess demand for bonds, the rate of interest must fall to MP'.

Assume, next, that the new financial assets are substitutes for bonds. A rise in demand for them does not affect the demand for money which remains at L. At OR rate of interest, the public's PN' demand for other financial assets than bonds is replaced by new institutional demand for bonds. The rate of interest is not affected.

If the other financial assets are substitutes for both bonds and money, the L curve shifts somewhat to the left, yielding an interest rate between MP' and MP. There are still other possibilities. For example, the financial assets other than bonds and money may be substitutes for money but complements of bonds. Then the interest rate must fall very sharply to accommodate the increase in demand for bonds by both spending units and nonbank intermediaries. If the other financial assets are complements of money but substitutes for bonds, evidently the rate of interest must rise. Both of these cases would appear to be unrealistic.

The analysis of multidimensional asset choice does not fit comfortably into the diagram's conventional geometry of liquidity preference. The NP demand for financial assets other than bonds or money is not solely a demand for liquidity. It is also a demand for security, income, insurance, and other services. Since, over the past half-century, NP has grown relative to an expanding RT, "liquidity preference" has come to be less and less relevant to determination of the rate of interest.

demand that is compatible with expanding capacity to produce. Otherwise some capacity lies idle, and the excess jeopardizes growth. If investment is accelerated by change in income, there is some rate of income growth that equates *ex-ante* saving and investment, or surpluses and deficits, at full-capacity output.

At this warranted rate of growth in income, with deficits and surpluses equal *ex-ante*, planned issues of debt by deficit spending units are equal to planned additions to financial assets by surplus spending units. Still the plans of deficit units and surplus units may be incompatible on financial grounds. At terms of lending which are appropriate to the warranted path of investment, surplus units may be disinclined to buy the entire direct debt issue of deficit units. Apart from changes in the speculative outlook for securities, surplus units should be expected to express a diversification demand for indirect financial assets and, in addition, a transactions demand for money to keep active balances in step with the rising level of income. If the warranted rate of growth in income is to be achieved, there must be some way of satisfying the demand for indirect financial assets that arises out of the rise in income, and the rate of interest that is relevant to it.

At the warranted rate of growth in income, illiquidity accumulates in the form of direct debt and exerts an upward pressure on interest rates that may inhibit income growth. Also, if income grows at its warranted pace, the demand for indirect financial assets, which deficit spending units cannot supply, also grows at some specifiable pace. Any complete growth model must reconcile the accumulating stock of illiquidity with the growing aversion to illiquidity at terms of lending that are suitable to the investment component of warranted income levels. The reconciliation evidently involves growth of financial intermediaries to absorb illiquid direct debt and to issue indirect debt according to the preference patterns of surplus spending units. Even if the warranted rate of growth in income were zero, direct debt would continue to grow and some portion of it would need to find its way into portfolios of intermediaries.

The need for indirect finance to hold interest rates on their optimal trend does not necessarily imply a high rate of growth for banking assets and the money supply in a buoyant economic system. Indeed the banking system may stagnate, without ill effects on the growth rate of income. In the growth process, spending units may choose to diversify their portfolios by adding to their holdings of nonmonetary indirect financial assets. Then, nonbank intermediaries absorb the requisite share of direct debt at the appropriate price. The growth of nonbank intermediaries relative to the banking system may imply

even downward pressure on interest rates at the very time when the growth of income is leaving the money supply far behind.[17]

In long-period analysis, it is a mistake to suppose that the optimal growth of the money supply is some simple function of trends in income or even of income and debt. The necessary growth in the money supply may be high or low, positive or even negative, depending on the growth of income, the share of spending that is externally financed (especially by long-term securities), the growth in demand by spending units for direct relative to indirect financial assets, and on the development of financial intermediaries whose indirect debt issues are competitive with money.

The complexities of a growth model that incorporates the financial as well as the real conditions of growth appear, for the present at least, to defy simple or even systematic formulation. The Keynesian short-period model is certainly inadequate, for the reasons we have mentioned and for others too. For example, its money markets are competitive markets where a host of deficit units meet a host of surplus units under the watchful supervision of the central bank. Rates on these markets may vary sharply in short periods. The rise of indirect finance implies that relatively few and relatively large intermediaries are interposed between ultimate lenders and ultimate borrowers. The result is that capital rationing becomes a more important allocative device, with the rate of interest tending to stabilize about its trend line.

Again, in the Keynesion model, "the" interest rate may fall to a floor that is established by absolute liquidity preference on the part of spending units. One apparent effect of indirect finance, of the institutionalization of saving and investment, is to reduce this irreducible minimum. Nonbank intermediaries may drive bond prices high both because funds must be invested to cover operating expenses and because, while the intermediaries are growing, the continuous net receipts of new funds make asset liquidation unnecessary. Growing intermediaries are "firm hands" that may acquire and hold both bonds

[17] This point may be put more concretely in terms of a modified form of equation (2) in note 14. It is necessary only to take into consideration the fact that part of the diversification demand for indirect financial assets (which in note 14 took the form solely of a demand for money balances) may in fact be satisfied by nonmonetary indirect financial assets. If, as before, the incremental diversification demand for indirect financial assets is $(1-e)abY$, suppose that $m(1-e)abY$ is the share of this incremental diversification demand that is satisfied by currency and deposits Then it appears that the rise in demand for money as income grows is affected by the rate of income growth $(\Delta Y/Y)$, the course of deficit finance (b), the issue of direct debt (a) to finance deficits, the demand for indirect financial assets $(1-e)$, the share of this demand which can be satisfied by nonmonetary indirect financial assets $(1-m)(1-e)$, and the intensity of the transactions demand for money (t).

and equities at prices which would be unreasonably high in a more primitive financial system.

An additional complexity is that development of financial institutions, including nonbank intermediaries, is both a determined and a determining variable in the growth process. The accumulation of assets and the secular rise in incomes stimulate the demand by spending units for financial services in increasing variety. The income elasticity of demand apparently is high not just for liquidity but for financial services in general, and the result in this country is that indirect finance has gained more rapidly than income, wealth, and direct debt. Moreover, any rise in interest rates brought about perhaps by a combination of restrictive monetary policy and accumulating debt creates the opportunity for nonbank intermediaries to offer more expensive attractions to creditors and hence to compete more actively with banks.

A shifting pattern of deficits and surpluses in the growth process may create opportunities for some intermediaries and destroy opportunities for others. All deficit spending units are not equally congenial borrowers for banks and for other intermediaries. All surplus units do not have the same complex of preferences among the financial issues of banks and other intermediaries. This financial incompatibility of spending units and intermediaries may give rise to "matching" problems, in which a shifting distribution of surpluses between spending units favors certain intermediaries that cannot, by law or custom, purchase the concurrent direct issues of deficit spending units. Then there is pressure to change the law or custom, the composition of direct debt, or preferences for financial assets among surplus units. Matching problems that stimulate financial innovation may arise in many other ways, for example from changes in the form of investment or in the geographic location of economic activity. The process of growth conditions, in these and other ways, the relative development of indirect finance in comparison with self-finance and direct finance, and the share of indirect finance that flows through banks and their competitors.[18]

[18] The processes of growth affect and are affected by other financial institutions than intermediaries. The stock market is a case in point. Bullishness on the market may increase the attractions of direct finance, reducing the rate at which intermediaries must grow in order to achieve an optimal trend in security prices. Bearishness may depress direct finance and require more rapid growth by intermediaries. In long periods the volume of dealings on the market, the behavior of its prices, and their importance to income levels are influenced by trends in methods of finance. When self-finance predominates, the market is a subsidiary element of the financial system, and even wide swings in its prices may affect investment negligibly. With development of direct external finance, price behavior on the stock exchanges should exert significantly greater influence on spending. Once indirect external finance has gained stature, financial intermediaries as large purchasers of direct securities may steady the market, reduce the frequency of wide price fluctuations, and moderate the influence of price fluctuations on deficit spending.

E. "MV" *and Financial Theory.* Conventional short-period doctrine about money and interest can be phrased in terms of the velocity of money. Velocity rises as the proportion of transactions balances (with positive turnover) gains relative to speculative balances (with zero turnover). This proportion is raised by an increase in income, given the money supply, or by a decline in the money supply, given the level of income. Since an increase in income or a decline in the money supply increases the interest rate, the interest rate is positively correlated with velocity.

Various exceptions to this relationship are familiar. Velocity may vary, with the interest rate given, if liquidity preference is infinitely elastic. The interest rate may vary, with velocity unchanged, if liquidity preference has zero elasticity. A shift in liquidity preference may disturb the relationship. Again, if both the money supply and income are variable, the relative behavior of velocity and interest rates depends on the elasticity of liquidity preference and marginal efficiency, and on the consumption function. For example, with liquidity preference inelastic, marginal efficiency highly elastic, and with a high marginal propensity to consume, one might expect a fall in interest rates simultaneously with a rise in the marginal velocity of money. The outcome for average velocity would depend, of course, on its initial level prior to the adjustment. The relationship of velocity to interest rates may be changed, too, by shifts in the spending functions.

The relationship between velocity and interest rates is still more attenuated when one allows not only for the complications listed above but also for the diversification demand for money and for the substitutability between money and other indirect financial assets. The diversification demand depends on the level of income, so that marginal and average velocity can vary according to rates of change in income without corresponding changes in interest rates. If other financial assets are available to satisfy the diversification demand, as substitutes for money, the money supply may fall and interest rates simultaneously decline as a reflection of the public's growing preference for these money substitutes. While income and debt are growing, the public may reject money balances in favor of insurance reserves, pension funds, or perhaps savings and loan shares. Because money becomes a smaller share of total financial assets, velocity becomes a less reliable index of interest rates.[19]

[19] In the 1920's nonbank intermediaries gained on banks at an especially rapid rate. The ratio of their assets to assets of banks rose from .77 in 1922 to 1.14 in 1929. In the same period income velocity of money with money narrowly defined, rose from 3.4 to 3.9 while long-term bond rates fell from 4.71 per cent in 1922 to 4.05 per cent in 1928 and 4.42 in 1929. Various reasons for the opposing movements in velocity and bond rate may be alleged, but one of them must have been the unprecedented growth of nonbank intermediaries.

As money becomes a smaller proportion of financial assets and as the demand for it comes to be related in a more complex fashion to interest rates and income, the "money approach" to analysis of interest rates and income loses precision. To make use of *MV*, one necessarily puts a more and more severe strain on the velocity component, or on the money component by including every financial asset. The strain may be too much to bear since a rise in *V*, with the narrow definition of money, may mean either that all credit expansion including that of banks is restricted, so that interest rates are rising, or that the flow of loanable funds is bypassing banks at falling rates of interest. If a rise in *V* is compatible both with credit ease and with credit tightness, one is tempted to conclude that time and financial evolution are outmoding *V* as an analytical tool. The allied concepts of hoarding and dishoarding necessarily fare no better.

If the *MV* approach to accounting for security prices and flows of income is ambiguous, so too is the monetary approach to explaining the level of prices for commodities. Prices of goods may rise because loanable funds are accessible too easily and cheaply through the intermediation of the monetary system. They may also rise because other indirect finance is too ample, given the flexibility of supply in real output. Prices may fall because deficits are depressed not only by "tight money" but by "tight savings deposits" or "tight insurance." As financial evolution proceeds, one salvages conventional quantity theory by so extending the concepts of *M* and *V* that they bear little resemblance to "means of payment" and "turnover of means of payment."

IV. *Financial Controls in a Growth Context*

Principles and techniques for regulating flows of loanable funds that are optimal in terms of short-period models, with money as the only indirect financial asset, may not be optimal in a growth context, with diversity of indirect financial assets. This is not the occasion to explore carefully how growth analysis may affect one's perspective on financial controls, but we do wish to point out a few illustrative leads.

A. *Monetary Control.* In the conventional short-period model, monetary controls shift direct debt between the central bank, the commercial banks, and the public. The effect is to change the money supply and the valuation of direct debt in terms of money to a degree that depends on speculative, precautionary, and transactions demands for money balances. This adjustment in the interest rate affects, perhaps, expenditures of spending units, their deficits, and so the flow of loanable funds.

There have been many proposals regarding the policy that should guide monetary controls in the long run; for example, that the money

supply should be induced to grow at a constant rate, or at the same rate as income, or at a rate higher than income to accommodate, say, the rising demand for liquidity that might result from gains in income or wealth per capita. One recalls, of course, the policy prescription that money should accummulate fast enough to keep the interest rate at its presumed irreducible minimum. None of these prescriptions seems to account adequately for effects on terms of lending of changes in growth rates of income and debt, in the structure of debt, in the variety of financial assets, and in relative demands for competitive varieties of financial assets.

Suppose, for the moment, that banks are the only intermediaries. We have seen previously that the behavior of national income cannot properly be the sole criterion of monetary policy. Growth in stocks of debt and output capacity may require growth in the stock of money even with the flow of income constant. But the monetary expansion associated with any growth curve of debt may be reduced if the direct debt itself can satisfy the diversification demand for financial assets. So short-term public debt may displace money, and debt management may displace monetary controls. In general, public-debt management and monetary controls should have identical goals, of satisfying the complex demand of spending units for financial assets at given terms of exchange between direct debt and money. There should be no opportunity whatever for them to work at cross-purposes.

At rising income levels there can be no simple formula of monetary expansion, even when money is the only indirect financial asset. To satisfy the transactions demand for balances, money may need to grow as fast as or faster than income. To satisfy diversification demand, at given interest rates, it may lag behind income. To offset the effects of growing output capacity and growing debt on propensities to spend, it may need to run ahead of income. How speculative and precautionary demands for balances vary as income rises is not apparent. For any rate of gain in income, the optimal growth of money cannot be determined independently of the specific growth context.

Growth of the money supply implies growth of the monetary system, especially of the central bank and the commercial banks. If the latter's reserve requirements are stable, they and the central bank must grow at about equal rates, each continuously absorbing direct debt of deficit spending units. With varying reserve requirements, commercial banks and central bank may grow at different rates. If reserve requirements rise for member institutions, the central bank acquires direct debt and supplies new money balances. If reserve requirements fall, the commercial banks do the job of indirect finance.

In view of its portfolio limitations, the central bank can grow most

readily when deficits are in the government sector. Relative growth of the central bank when government debt is a fixed stock has the disadvantage of withdrawing from the markets government securities that may be more or less close substitutes for money. In this case, to maintain interest rates, the money supply may need to grow faster if it is provided by the central bank than if it is supplied through purchases of private securities by commercial banks.

If accumulating direct debt is private debt and if the central bank is subject to customary restraints on the kinds of assets it may hold, monetary growth apparently should be concentrated in commercial banks, and their reserve requirements must take the downward trend. This prospect is disturbing on at least two counts. First, for reasons well known in banking theory, low reserve requirements for commercial banks increase short-period instability in the money supply. Second, the commercial banks can assume only at some risk the responsibility for supplying a rising share of indirect finance. As principal administrators of the payments mechanism, they must be solvent beyond doubt. As financial intermediaries, on the other hand, the commercial banks must underwrite the growth process with venture finance, buying securities from spending units that are taking the risk of innovation and expansion. In one role, the banks must minimize risk; in the other role, risktaking is necessary and proper.

Unless, then, there are government deficits in the growth process, the monetary system is not the ideal vehicle for financial growth. The direct securities that accumulate with real growth in the private sector do not tend to match the portfolio requirements of the central bank or of an indubitably solvent commercial banking system. This handicap can be counterbalanced if the central bank portfolio is liberalized or, say, if there are government guarantees of bank deposits and bank assets. It can also be aggravated by unimaginative bank management or such restrictive banking regulation as the ban on branch banking which keeps the lending capacity of individual banks from growing with the borrowing requirements of individual deficit spending units. The fact is, in this country, that the banking system has not been able simultaneously to keep solvent, to absorb even a constant share of the expanding supply of direct securities, and to keep pace with the expanding demand for indirect financial assets.

B. *Financial Control.* Inadequacy of the monetary system has at least two effects. It provides an incentive to self-finance, especially for large business firms. Second, it creates opportunities for competitive development of nonbank financial intermediaries. When monetary expansion is restrained, real growth supplies the direct securities at at-

tractive prices as well as the demand for indirect financial assets that other intermediaries can exploit.

These nonmonetary intermediaries have not been acknowledged generally in this country as competitors with banks, and as substitutes for them, in easing terms of external finance and hence of deficit spending. Regulatory techniques have not been evolved in any systematic way to cope with them as instruments of indirect finance. Their equivalent of the Federal Reserve Act is still to come.

The lag of regulatory techniques behind the institutional development of intermediaries can be overcome when it is appreciated that "financial control" should supplant "monetary control." Monetary control limits the supply of one financial asset, money. With a sophisticated financial structure providing financial assets, other than money and bonds, in increasing proportion to both, control over money alone is a decreasingly efficient means of regulating flows of loanable funds and spending on goods and services. Financial control, as the successor to monetary control, would regulate creation of financial assets in all forms that are competitive with direct securities in spending units' portfolios. "Tight finance" and "cheap finance" are the sequels of "tight money" and "cheap money."

A monetary authority which is tempted to stay within the bounds of its traditional controls because they are quantitative, general, and impartial, may find itself more and more out of touch with credit developments in critical growth areas where lending by nonbank institutions is predominant. Traditional controls are more appropriate to competitive loanable-funds markets than to markets that are dominated by a few large institutional lenders such as insurance companies. On imperfectly competitive markets, where a few nonbank institutional lenders are important market forces, capital rationing may become the critical medium for enforcing financial control.

Nonbank institutional lenders give rise to special problems in financial control because they are imperfectly competitive and also because they are specialized. Since they do buy a rather narrowly limited variety of assets and issue specialized varieties of indirect financial claims, there can be a credit impasse that is not characteristic of open and competitive markets for loanable funds. Intermediaries whose debt may be in demand by spending units may be inhibited by law or self-restraint from lending to sectors where demand for capital formation is most active. Traditional monetary controls do not solve this issue of debt incompatibility.

There are solutions. One is to relax legal restraints, say by permitting insurance companies to invest in mortgages and common

stocks, so that intermediaries become less specialized. The intermediaries themselves may venture into new varieties of asset and debt. Secondary intermediaries such as personal finance companies, may arise to assume risks that primary intermediaries avoid. Government institutions may hold securities not wanted elsewhere, may guarantee such securities, or discount them. Solutions for this problem of matching borrower and lender have been found. But they have been found with some delay, and it is not always apparent that they are the optimal solutions.

Central bank operations in long-term public debt may reverberate further through the financial system than operations in short-term debt. According to the doctrine of credit availability, such important intermediaries as insurance companies and savings banks are sensitive to change in bond prices or to uncertainty about bond prices. The liquidity of their portfolios is reduced by a rise in rates on Treasury bonds. To restore liquidity, intermediaries tend to buy still more government securities, possibly of shorter maturity. They tend also to contract direct lending on mortgages or industrial loans. The contraction of lending may mean a rise in interest charges to private borrowers, but its immediate and perhaps most powerful implement is credit rationing.

This availability doctrine acknowledges the parallelism between banks and other intermediaries. It imposes on the central bank responsibility for supervision over indirect finance generally rather than over indirect finance through banks alone. We cannot be sure that it is based on a sound estimate of intermediaries' portfolio practices, but we do regard it as a provocative step in the transition to theorizing about financial control as distinct from monetary control.[20]

[20] Samples of the literature on the credit availability doctrine include, Statement of Paul Samuelson, *Monetary Policy and the Management of the Public Debt*, Hearings before the Subcommittee on General Credit Control and Debt Management of the Joint Committee on the Economic Report, 2nd sess., 82nd Cong., March 1952, pp. 694-98, 740; Ira O. Scott, Jr., *Monetary Policy, the Theory of Assets, and the Availability of Credit*, *passim* (doctoral dissertation, Harvard University, 1953); Robert V. Rosa, "Interest Rates and the Central Bank," *Money, Trade, and Economic Growth, Essays in Honor of John Henry Williams* (New York, 1951), pp. 270-95.

THE FACTOR PROPORTIONS PROBLEM IN UNDERDEVELOPED AREAS

By R. S. Eckaus*

The concepts "structural disequilibrium," "overpopulation," "technological unemployment" and "underemployment" appear frequently in the literature on underdeveloped areas and there is considerable discussion of the comparative desirability for use in such areas of relatively labor-intensive or capital-intensive techniques. This paper is intended to help clarify some of the underlying issues and to begin to provide a theoretical basis for their analysis.

Many of the underdeveloped areas of the world have large agrarian populations in which there is either persistent open unemployment or in which the marginal productivity of the working force is so low that it is commonly believed that withdrawal of a sizable fraction would not significantly affect output. This seems to be the case to varying degrees for much of Asia and the Middle East. Other countries, such as Italy, show persistent urban as well as rural unemployment or underemployment. It is a common feature of the unemployment in these countries that it fails to respond to fiscal policy measures designed to increase employment by stimulating effective demand. Use of conventional income-generating techniques appears in fact to create inflationary pressures and balance-of-payments difficulties long before full employment is approached.

This interpretation of the condition of many underdeveloped areas has led to the formulation of a number of alternative explanatory hypotheses which are presented in Section I. One of these hypotheses appears, at this stage of investigation, to be particularly fruitful in casting light on some of the outstanding characteristics of underdeveloped areas and is elaborated in Section II. Two approaches to the problems of empirical testing of the hypotheses are outlined in Section III.

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The hypotheses presented below suggest that the unemployment difficulties of underdeveloped areas are not basically due to lack of effective demand but stem from "market imperfections," limited opportunities for technical substitution of factors and inappropriate factor endowments.[1] The techniques of analysis of factor market imperfections are well known.[2] The implications of limited technical substitutability of factors were first analyzed by Abraham Wald[3] and more recently by the linear programming techniques.[4] Further development of the theoretical analysis in this paper consists mainly of an elaboration of geometrical techniques, which are used to apply the theory specifically to the problems of underdeveloped areas.

I. *The Factor Proportions Hypotheses*

The analysis which follows has grown out of the suggestion by C. P. Kindleberger that underdeveloped areas such as Italy are characterized by "structural disequilibrium at the factor level." This concept, formulated by Kindleberger and E. Despres, is identified as follows:

> Disequilibrium at the factor level may arise either because a single factor receives different returns in different uses or because the price relationships among factors are out of line with factor availabilities.[5]

This suggestion has been the starting point for two types of explanation of unemployment or underemployment in underdeveloped areas. The first type assumes that available technology would permit full use of the working force at some set of relative prices and finds the source of unemployment in various types of "imperfections" in the price system. The second type suggests that there are limitations in the existing technology or the structure of demand which lead to a redundancy of labor in densely populated, underdeveloped areas. The two types of hypotheses are combined in Section II to obtain a more general analysis.

[1] The hypotheses and analysis have come to be known at the Center for International Studies, M.I.T., as the "factor proportions" problem.

[2] *E.g.*, Joan Robinson, *Essays in the Theory of Employment*, 2nd ed. (Oxford, 1947), Ch. 2.

[3] A. Wald, "Über einige Gleichungssysteme der mathematischen Ökonomie," *Zeitschr. f. Nationalökon.*, Dec. 1936, VII, 636-70; *cf.* also, W. L. Valk, *Production, Pricing and Employment in the Static State* (London, 1937), p. 58.

[4] *E.g.*, R. Dorfman, *Application of Linear Programming to the Theory of the Firm* (Berkeley, 1951). In an as yet unpublished paper ("Full Employment and Fixed Coefficients of Production") M. Fukuoka also related the assumption of fixed coefficients in production to the problem of unemployment.

[5] C. P. Kindleberger and E. Despres, "The Mechanism for Adjustment in International Payments—The Lessons of Postwar Experience," *Am. Econ. Rev.*, Proceedings, May 1952, XLII, 338.

A. *The Market Imperfections Hypotheses*

In the accompanying figure the vertical axis represents the rate of real wages and the horizontal axis the amount of labor. The curves *DD'* and *SS'* represent the aggregate supply and demand relations for a typical industry if factor markets are competitive. Under competitive conditions the wage rate would settle at *E*.[6]

Suppose, however, that trade union pressures, immobility of labor, government social legislation or other factor-market imperfections maintain the wage rate at *W* rather than allowing it to fall to *E*. The effective labor supply curve would be *WS'*. At the higher wage rate the demand for labor would not absorb all the labor available and it could be said, as Kindleberger does, that, *ceteribus paribus*, the wage rate does not represent factor endowments.

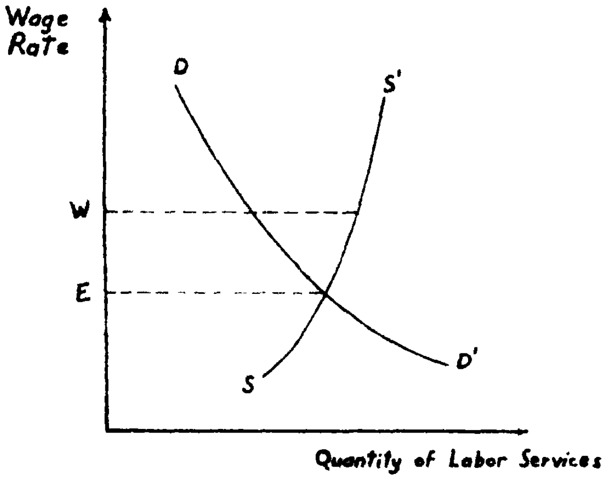


FIGURE 1

To isolate the influence of various types of imperfections let us now consider a case in which factor mobility, or lack of it, is not important and continue to confine the analysis to a closed economy. If the system had become adjusted to a particular complex of rigidities there would be no need for factor mobility in the absence of changes in techniques or tastes.[7]

[6] Fixed supply and demand curves such as those in Figure 1, suppose, of course, constant resources, technology and consumer tastes.

[7] "If effective demand always moved up and down in the same well-worn channels, a supply of each type of labor would always be ready waiting to meet demand for it, when effective demand expanded, and the question of mobility would not arise." Joan Robinson, *op. cit.*, p. 30.

The comparative use of the factors of production, depending as it does on the factor-price ratios and technology, would, however, reflect the "true availability" of labor only if wages were kept at *E* in Figure 1. If wages are kept at *W* there is an "artificially" high ratio of the price of labor to the price of capital. Since we are explicitly assuming that factor substitution is, in fact, possible, a structure of production may result with a higher capital-labor ratio than otherwise. If the diagram were representative of large parts of an economy, as output increased full employment of the given labor force would require the use of more capital than if the structure of production were adjusted to a lower labor-capital price ratio, unless the substitution effects were offset by increasing returns to scale. In a country in which capital was scarce and unemployment of considerable magnitude, the attempt to achieve full employment by use of relatively capital-intensive investment would be more likely to lead to inflation and balance-of-payments difficulties, short of full employment, than if more labor-intensive techniques were used.

The development of social policy in economically underdeveloped areas frequently proceeds more rapidly than economic growth. Imitation of the techniques of more advanced countries is not confined to technology. Elaborate social security legislation and aggressive government-encouraged union movements are often found in densely populated, low per capita income countries which are just on the threshold of economic advancement. There is little or no scope for such devices for raising wages except in the relatively more advanced and well-organized sectors. Therefore, new industrial projects may face the prospect of wage rates quite different from those prevailing in the handicraft and agrarian sectors and thus may be compelled to use different factor proportions. These considerations suggest that the foregoing analysis may be quite relevant for underdeveloped areas.

The next step in the analysis is to abandon the assumptions of constant technology and consumer tastes and to investigate the effects of changes in the composition of demand for goods and factors due to such influences as changes in methods of production or in the directions or levels of demand as a result of changes in tastes or foreign competition. In this second case, as the level of aggregate effective demand rises, goods will be demanded in different proportions than formerly and the location and magnitudes of the demand for factors of production will shift. If labor is not mobile, or if it takes considerable wage increases to shift it, then factor disequilibrium such as depicted in Figure 1 for the preceding case of constant tastes and technology would develop in certain industries. An increase in the level of effective demand would push other industries to the limits of capacity relatively quickly in

this second case. Money wages and prices would begin to rise, not uniformly but in the "bottleneck" sectors, prior to the achievement of general full employment. New investment in these sections would tend to increase still further the substitution of capital for labor while offsetting tendencies in the relatively stagnant sectors would work slowly, if at all. The balance of payments under the pressure of growing domestic inflationary pressures and increased demand for capital imports would tend also to develop deficits at an earlier stage in the expansion of national income. This could all be superimposed upon and could aggravate the "factor disequilibrium" previously discussed. It would be distinguishable, however, as there would be evidence of excess capacity and stranded capital-goods resources indicating an original misallocation or a structural shift.

There is at least superficial evidence to suggest that the factors stressed in this hypothesis may be operative in some underdeveloped countries. For example, although Italy has a persistent unemployment of about 2 million in a population of around 47 million, there are also some sectors of the Italian economy, such as shipbuilding, in which there is persistent unused physical capital plant and equipment. Moreover, we would expect that in underdeveloped areas the working force would be even more bound by tradition, reluctance to change location and barriers to social as well as physical movement than is the case in more advanced, industralized countries; this would also contribute to the problems created by structural change.

Closely related to this second hypothesis is an explanation which locates the source of factor disequilibrium in barriers to the entry of new firms into profitable industries whose expansion is limited by various types of monopolistic restrictions. This and the other types of "imperfections" could aggravate the "factor disequilibrium."

One further related hypothesis remains to be considered here.[8] Suppose that, whatever the actual characteristics of the production function and degree of technical substitutability of factors, businessmen believe that they face a production function with constant coefficients, *i.e.*, no factor substitution is possible. Indian businessmen, for example, may believe that the "American way" of producing is the best and only way and that this always involves high ratios of capital to labor. Plant engineers accustomed to emulating "Western" technology may not be sensitive to the range of choice actually available in manufacturing processes and may impose unnecessary technical constraints on managers in underdeveloped countries. Thus in Figure 2, although the solid lines, x_1, x_2 . . . may represent the real contours of

[8] I am indebted to F. M Bator for the suggestion of this case.

the production function, businessmen may regard the dashed lines x_1', x_2' . . . as the ones along which they must move.

In this case the expansion path P would be independent of the factor-price ratios, and, therefore, of the supply curve of labor such as indicated in Figure 1. Expansion of effective demand would tend to run into the limits imposed by capital capacity prior to the achievement of full employment with consequent inflationary tendencies and balance-of-payments difficulties. This could take place even if Figure 2 were not characteristic of all sectors of industry.

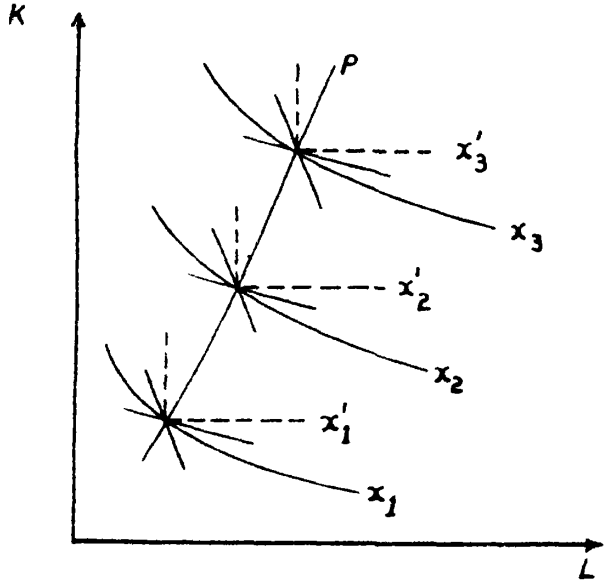


FIGURE 2

B. *The Technological Restraints Hypothesis*

It is fairly common for observers to report finding modern, capital-intensive equipment and techniques used in underdeveloped areas where relative factor prices would suggest the use of more labor-intensive techniques. I should now like to suggest that the use of the "modern" techniques is not necessarily irrational emulation but the result of real limitations in the technological choices available, and that this, in turn, is a major source of labor employment problems in underdeveloped areas. At this point the exposition will be oversimplified to indicate in stark outline the nature of the argument. In the next section the hypothesis will be combined with some of the market imperfections hypotheses in an attempt to describe some of the major characteristics of underdeveloped and overpopulated areas by the use of a relatively simple theoretical framework.

The basic assumptions of the following analysis are: (1) in large sectors of an economy there are only a few alternative processes which can be utilized; (2) these processes are relatively capital-intensive.[9] There have been frequent comments which describe certain features of underdeveloped and overpopulated areas as essentially the result of limited variability in the coefficients of production. An example of this kind of comment is the frequently observed "underemployment" in agriculture, where this is taken to mean that, with agricultural techniques remaining unchanged, withdrawal of farm labor would not reduce output.

The Case of One Good, Two Factors and One Process. In the first, most simple case to be considered, suppose that only one good is produced in the economy, national product, which requires two factors,

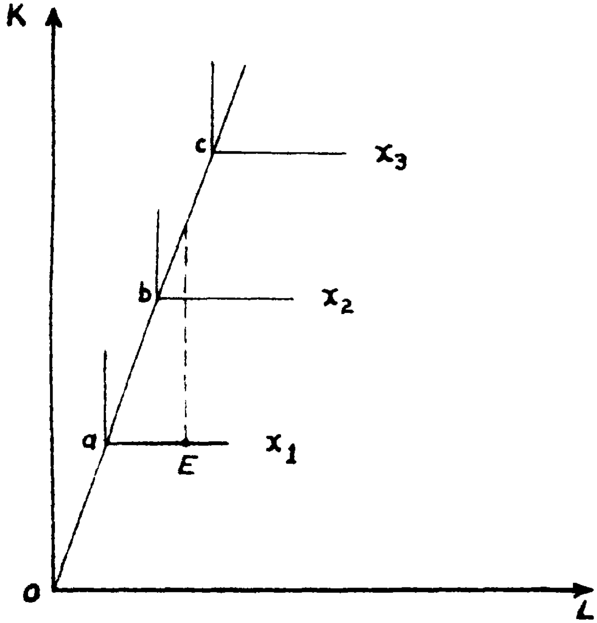


FIGURE 3

capital and labor.[10] Assume also that only one process can be used to produce national product, *i.e.*, that the factors must be used in fixed proportions. This situation is represented in Figure 3, where the heavy

[9] A production "process" is a way of combining different factors of production whose *proportions* are determined by technology, although the *scale* of production and thus the absolute quantities of the factors used may be freely variable.

[10] Confining the analysis to only two factors is not essential but highly convenient for geometrical demonstrations.

black line represents national output, x_1 of 1 unit; the lighter lines represent higher outputs. Quite irrespective of relative factor prices, points *a*, *b*, *c*, etc., represent the combinations of factors which will be used to produce output and the slope of the line joining these points is equal to the constant, capital-labor ratio.

Only when the factors of production are actually available in proportions equal to the fixed capital-labor ratio is there the possibility that both can simultaneously be fully utilized. If the actual factor endowment is off the line *oabc*, for example, at point *E*, there must inevitably be some unemployment of labor which is not amenable to any fiscal or monetary policy for its alleviation. Labor is a redundant factor and only by increasing capital stock in the amount indicated by the length of the dashed line can the unemployment be eliminated.[11] Conventional compensatory fiscal policy would, in this case, only result in inflationary pressures. The persistent open and "disguised" unemployment in underdeveloped countries may be at least partially of this kind.

Two or More Processes. Suppose now that a second and a third relatively more labor-intensive process is developed for the production of the same good, national output, so that three processes are now available. This is represented in Figure 4 by the existence of two more right-angled constant-product lines for a unit of output and two additional expansion paths, *ocd* and *oef*.

In addition to the alternative combinations of factors which may be used to produce a unit of output represented by points *a* and *c* and *e*, the lines *ac* and *ce* also represent combinations of factors which will yield a unit of output. It is possible to be between *a* and *c* on line *ac*, for example, by using the first process and the second process in different combinations. If the resources are taken away from the first process, output would fall. But if these resources are then used in the second process, output would rise. It can be shown rigorously[12] and may be appreciated intuitively that there is some withdrawal of factors from process 1 and subsequent use in process 2 which will restore output to the unit level. Correspondingly the line *bd* represents combinations of process 1 and process 2 and of the two factors capital and labor which are optimal for the production of the x_2 level of output.[13]

[11] I recognize that it is stretching a definition considerably to call redundant factors "unemployed." However, since it is specifically the hypothesis of this paper that the labor called "unemployed" or "underemployed" in underdeveloped areas is redundant, I shall, with this warning, use the terms interchangeably.

[12] *Cf.* Dorfman, *op. cit.*, pp. 39-41.

[13] It can be seen by drawing a line from *a* to *e* that, for any output, any combination involving processes 1 and 3 would require more of at least one factor than a combination of processes 2 and 3.

In this second case where several processes are available the proportions in which the two factors can be used are not confined to either the expansion path of the first process or the expansion path of the second process, or both, but may be any place within the area bounded by *oab* and *oef*. Thus the factor endowment E_1, while inevitably implying some unemployment of labor when only the first process was available, can now be fully utilized by using the first process on a smaller scale and switching some of the capital to the second process. If, however, the factor endowment should be outside the area bounded by the

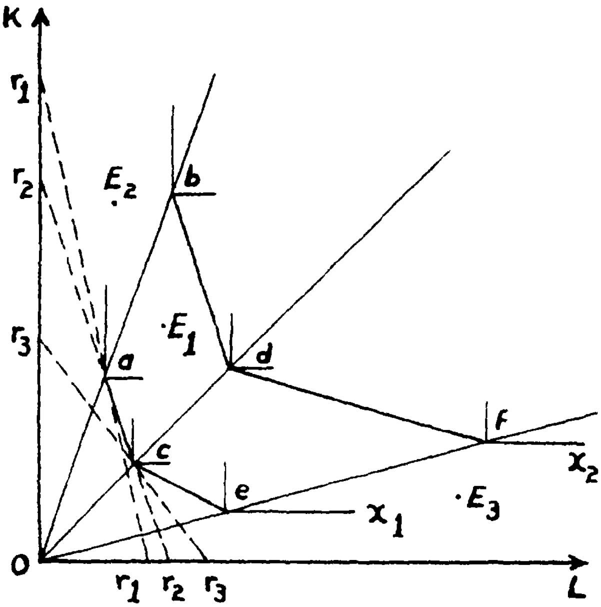


FIGURE 4

two expansion paths, at E_2 or E_3, for example, structural unemployment of capital capacity or of labor would ensue in exactly the same manner as in the preceding case of one process, regardless of factor-price ratios or fiscal policy.

If more than two processes are available to the economy, full employment of all factors will be *possible* at a nonzero wage so long as the proportions in which factors are endowed fall on or within the limits set by the processes with the most extreme factor-use ratios. This suggests an observation which is, by now, almost trite: reduction of underemployment in overpopulated areas requires the addition of scarce factors. This may, however, be accomplished in a variety of ways, such as the use of dry farming methods and drought- and heat-resistant hybrids which increase the land available for farming.

In the case in which just one process is available, changes in relative factor prices can not affect the proportions in which factors are used. This is not true when there are two or more processes available. In this case factor proportions employed will, in competitive markets, vary with factor prices and the achievement of full employment, if technologically possible with the given factor endowment, will depend on factor prices. In Figure 4, r_1, r_2 and r_3 are constant-expenditure lines illustrating three possible sets of factor prices. The line r_2 has the special feature that its slope is equal to that of the constant-product curve between points a and c.[14]

If the price ratio of factors were of the r_1 or r_3 types only one process and one ratio of factors would be used. To employ completely each of the factors in an endowment like E_1, the very special factor-price ratio r_2 would be necessary. A factor-price ratio slightly different from r_2 would be sufficient to move factor use ratios away from E_1 to one of the isoquant vertices. Moreover, having reached a vertex of an isoquant it would be possible for large changes in relative factor prices to occur without leading to factor substitution.

Two Goods and Two Factors. An interesting question is whether the restriction of the analysis to only a single good is responsible for the character of the conclusion. By use of an Edgeworth-Bowley type box diagram we can continue to have the advantage of graphic techniques without loss of simplicity and extend the analysis to the case of two goods.

Let us now assume that we have two goods x_1 and x_2, each of which can be produced by two, fixed-proportions processes, and that constant returns to scale prevail;[15] only two factors, capital, K, and labor, L, are used. Figure 5a shows a few of the infinity of equal-product lines which could be drawn for different outputs of the two goods. The solid lines refer to product 1, the dashed lines to product 2. In Figure 5b, these isoquants are used to construct a box diagram. The dimensions of each side of the box represent the total amount of factors available. Any point within the box simultaneously represents four quantities: the amount of capital and the amount of labor used in producing x_1 which is determined by measurement from the lower left-hand corner, and the amount of capital and the amount of labor used in the x_2 industry, measured from upper righthand corner.

Figure 5b provides the basis for the derivation of the "efficiency

[14] Constant expenditure lines r_4 and r_5 could be drawn analogously to r_2 and r_1, with a slope equal to that of *ce*, and less than that of *ce*, respectively.

[15] The assumption of constant returns to scale is, of course, maintained not because it is considered the best description of reality but for its analytical convenience. Some comments on the effects on the analysis of dropping this assumption are made below, p. 556.

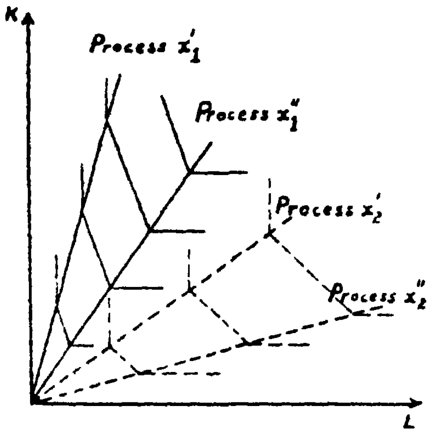


FIGURE 5A

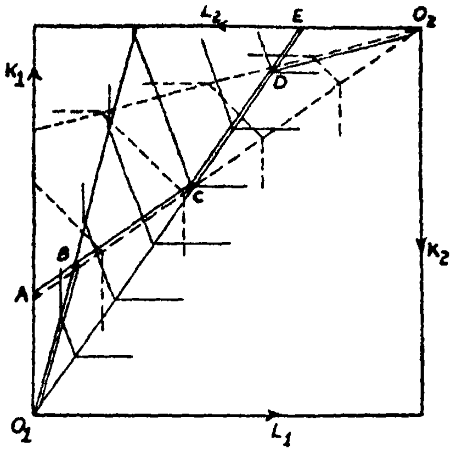


FIGURE 5B

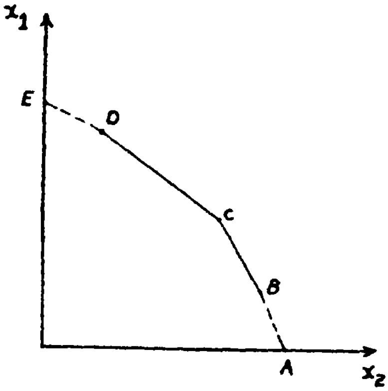


FIGURE 5C

locus" for the two goods x_1 and x_2 If production takes place at any point off this locus, it is possible by recombination of factors to produce more of one good without diminishing the output of the other. If along the efficiency locus corresponding amounts of the two goods are read off and plotted on a chart as in Figure 5c, the transformation or production-possibility curve between x_1 and x_2 is obtained.

To locate a point on the efficiency locus we must specify a particular amount of x_1 to be produced and find the maximum of x_2 which can simultaneously be produced. Graphically, we must move along the specified x_1 isoquant crossing x_2 equal-product lines until we reach the highest x_2 isoquant obtainable. The optimum positions achieved will thus be located at tangencies of the x_1 and x_2 equal-product lines where the lines just touch without crossing. Since, in the present case, each equal-product line is made up of segments of straight lines, the optimal

positions will be corner tangencies. By repetition of this maximizing process for a series of points the entire efficiency locus can be determined.

Since in the present case the efficiency locus for the two goods is a rather complicated succession of line segments we shall trace it out carefully. Starting at O_1, zero output of x_1, the maximum output of x_2 obtainable is indicated at point A and could be computed by dividing O_2A by the scale factor applicable to process x_2'. If output of x_1 is now increased relative to x_2, it will be most efficient, at first, to use process x_1' and for x_2 to be produced with process x_2'; production of x_1 would then move along the expansion path O_1B and x_2 should decrease along the expansion path x_2' to point B. In this first stage capital is a redundant factor and labor is relatively scarce. The economic system adjusts to this condition by directing the use of the most capital-intensive processes to be used for the production of both goods.

As production of x_1 is expanded beyond point B it would be best now to use both process x_1' and process x_1'' in combinations indicated by the intersection of O_2A with the constant-product lines for commodity x_1 as long as these intersections lie between the expansion paths of x_1' and x_1''; production of x_2 should continue to be by means of process x_2' alone, however. This second stage is indicated by the points on the segment BC which belong to both the combination of x_1' and x_1'' and process x_2'. By tracing along an x_1 isoquant between B and C it can be seen that shifting to the expansion path O_2A makes possible a larger production of x_2 for the particular output of x_1 than if we had remained on the path O_1B. As production of x_1 is expanded in this stage and production of x_2 is decreased, capital becomes more scarce relative to labor due to the relatively high labor-capital ratio of the resources released by the decrease in production of x_2.

In the third stage, as output of x_1 is farther increased, it is most efficient to use only process x_1''. But now for any given output of x_1, the maximum amount of x_2 can be obtained by use of the more labor-intensive process x_2'' in combination with process x_2'. The third stage on the efficiency locus is indicated by line CD.

Finally, still further expansion of production x_1 continues to be best done along the expansion path of process x_1'' until, at point E, x_1 is being produced to the complete exclusion of x_2. In this fourth and final stage the output of x_2 should be produced only by process x_2''.

Only in the fourth stage and the first stage of the efficiency locus would optimum allocation imply some unemployment of one of the factors. In the first stage the unemployment of capital for different outputs of x_1 and x_2 is indicated by the vertical distance between lines AB and O_1B. In the final stage the unemployment of labor is measured by the horizontal distance between lines DE and DO_2.

Actually the occurrence and qualitative significance of any of the stages depends on both technology and factor endowments. If process x_1'' were relatively more labor-intensive than is shown, its expansion path would pivot to the right and stage 2 in Figure 5b would be prolonged. As common sense would suggest, development of a sufficiently labor-intensive process for x_1 could cause stages three and four to disappear entirely and with them the possibility that there could be an "optimal" configuration which involved unemployment of labor. A similar effect would result from a decrease in the amount of labor endowment. This could be depicted by squeezing together the left- and right-hand sides of the box in Figure 5b. Increasing the labor supply would mean stretching the box horizontally. This would not only increase the range of outputs associated with stage 4 but also, if pushed far enough, first eliminate stage 1, the capital unemployment stage and then stage 2.

The points $ABCDE$ on the technical transformation curve in Figure 5c correspond to the similarly lettered points on the efficiency locus in Figure 5b.[16] At first when only a little x_1 is produced and, relatively, a lot of x_2, we should move along the segment AB using process x_1' and x_2'. Unemployment of capital associated with this segment on Figure 5b will be reduced as we approach B. Relative labor scarcity is limiting along this segment and the slope of the line segment AB will depend on the ratio of the labor inputs of output of x_2 to x_1. The relative labor intensity of process x_2' compared to process x_1' as drawn on Figure 5a accounts for the steepness of the segment.

The line segment ED on Figure 5c has an exactly analogous justification to that for the segment AB. Labor unemployment will be reduced as D is approached from point E. Capital is the only scarce factor and the relative capital intensity of process x_1'' as compared to process x_2'' accounts for the flatness of ED.

Point C is located conveniently relative to points B and D. More of x_1 is produced at C than at B, though not so much more as produced at point D. Likewise less x_2 is produced at C than at B though not as much less at D. The segments BC and CD will be straight lines as can be verified by noting in Figure 5b that, due to the assumption of constant returns to scale in all processes, there must be a constant ratio between changes in output of x_2 along the line O_2A between C and B, for example, and changes in output of x_1.

It was pointed out with regard to the efficiency locus in Figure 5b that changes in factor endowment and technology could shorten, extend

[16] In the constant-returns-to-scale case, only relative factor endowments are important in determining the *shape* of the transformation curve. If the absolute factor endowments were changed while relative factor endowments remain constant, it would amount to sliding the northeast and southwest vertices of the box on the connecting diagonal.

or even completely eliminate various stages of the efficiency locus. This applies also to the separate segments of the technical transformation curve. The technical transformation curve of Figure 5c illustrates all the possible stages which could be produced by this simple case, from unemployment of capital to unemployment of labor. It should not be presumed that this range of possibilities will actually exist in a particular system at any one time. Rather, it is the hypothesis of this paper that technology and factor endowments in underdeveloped areas are such that a segment like *DE*, in which labor is redundant, is important in their transformation curves.

To demonstrate the importance of demand conditions for employment when the conditions assumed in the present hypothesis exist, we shall draw a transformation curve in Figure 6 consisting only of stage

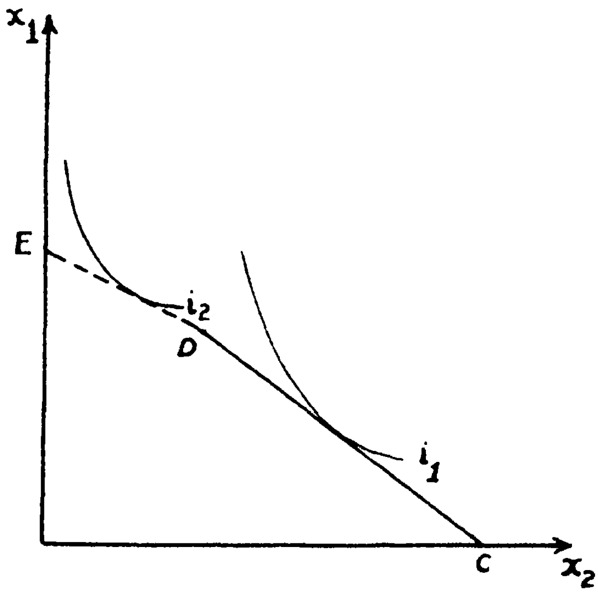


FIGURE 6

CD, along which there is full employment of both capital and labor, and the labor-redundant stage *DE*. This can be envisaged as the result of a high rate of population growth which has stretched the labor axis very far. We can now see that actual achievement of full employment depends on the relative demands for the two goods. Market baskets whose composition falls along *CD* will allow full employment; along *DE* labor will be redundant. A geometrical demonstration which is suggestive, though lacking in rigor can be given. Suppose that the lines i_1 and i_2 represent two different possibilities for the community's indifference curve for the two goods. Only in the case in which the in-

difference curve is tangent along *CD* will optimal output imply full employment. The community must face a conflict in goals between full employment and maximum value of output if i_2 is in fact its indifference curve.[17] Extending the analysis to include many goods would widen the range within which factor endowments could vary without unemployment of one or more factors resulting. There would, however, still be no guarantee that the composition of goods demanded would always hit on a full-employment point.

It may also be observed that if it is possible to buy and sell in foreign trade at price ratios between the slopes of *CD* and *DE*, full employment would again be possible though not necessary. To determine whether or not it would result, it would be necessary to know the reciprocal demands for exports and imports.

It would be possible to elaborate this model now by investigating the implications for the analysis of market imperfections such as were considered in the previous section. This extension will be postponed to the following section, however, and applied to a model of underdeveloped areas designed to be somewhat more realistic. As it stands the present analysis gives us, I believe, important insight into the problems of underdeveloped areas. It presents a hypothesis which helps account for the inflationary tendencies of underdeveloped areas under the impact of programs designed to raise effective demand, and for the stubbornness of unemployment in such areas.

The analysis of this section also provides a more precise definition for the "technological unemployment" mentioned in *Measures for the Economic Development of Underdeveloped Countries*.[18] Technological unemployment may be a real problem for underdeveloped areas if it is defined, as in this section, as redundant labor arising from resource and technological restraints and the structure of demand.

II. *A Model of Underdeveloped and Overpopulated Areas*[19]

Though the analysis of the previous section is suggestive, it is hard to believe that all of the unemployment and underemployment in underdeveloped areas represents literally uselss labor. Moreover, the assumption of only a few alternative processes and a quite limited range for

[17] A major qualification to this analysis, still on the static level, is the possibility that the shape and position of the community indifference curves might not be independent of the particular processes or combinations of processes which are used. To handle this difficulty it would be necessary to determine the shifts in income distribution which result from changes in factor prices and to explore the differentials in tastes of the recipients of the different types of income.

[18] United Nations, Department of Economic Affairs (New York, 1951).

[19] I am particularly indebted to P. N. Rosenstein-Rodan for discussion of the issues raised in this section.

substitution of factors does not seem to fit well the technological characteristics of a number of important industries, as, for example, agriculture. I shall attempt therefore to move toward greater realism by use of a two-sector model (one section with fixed, and one with variable coefficients of production), and investigation of the effects of market imperfections in such a system. To the assumption of limited opportunities for substitution in some industries is added the hypothesis that in many other industries there is a considerable range of variability in the proportions in which factors can be used.

It will be useful to initiate the discussion under the assumption that each of the two sectors produce the same product. Suppose that in Figure 7 the constant-product lines of the fixed-coefficient industry are represented by the lines x_1, x_2, ...[20] and the constant-product lines of the variable coefficient industry by the lines x_1', x_2' . . . .

The output x_1 could be produced by the factor combination and technique represented by point 1 or any of the factor combinations using the variable proportions technique represented by the line x_1'. Moreover, following the reasoning on page 546 above, it is also possible to produce x_1 by simultaneously using both the fixed-coefficients and variable coefficients techniques. All of the lines which could be drawn from point 1 to line x_1' represent a *combination* of methods which would produce output x_1: all such lines fall between the lines 1*a* and 1*b* which are drawn from point 1 just tangent to line x_1'.[21] The "efficiency locus" for specified outputs can be traced out by determining, for given amounts of one of the factors, the minimum amount of the other factor necessary to produce the output. If this is done for output x_1 when very little labor is available it is best to produce by the use of the variable coefficients process alone, a representative factor use for this case is at point *p*. As more labor becomes available the minimum amount of capital required to produce x_1 is found by sliding down the variable coefficients constant-product line to point *a*. Line *a*1 represents different combinations of the variable-coefficients technique located at *a* and the fixed-coefficient process. When the labor available is further increased, the minimum amounts of capital necessary to produce x_1 are found by moving along line *a*1. As labor available is still further increased the line 1*b* is the next segment of the efficiency locus used, for reasons analogous to those given for the use of segment *a*1. Finally, when labor

[20] Although the constant-product lines for the fixed-coefficients sector are drawn in Figure 7 as if only one process is available, the demonstration is perfectly general and its implications are applicable when more than one process is available for the fixed-coefficient industry.

[21] I am indebted to R. Solow for the criticism of a previous paper which led to this formulation.

is increased beyond the amount available at point b, again only the variable coefficients method should be used to produce x_1.

Output x_1 could also be produced by process combinations and amounts of factors which do not lie on the efficiency locus, of course. Line $p1$ represents a series of such combinations, using in varying proportions the variable coefficients techniques located at p or n and the fixed-coefficient process located at point 1. Any combination of methods along $pn1$, however, would result in higher costs for x_1 than a method found on the efficiency locus; methods along $pn1$ could also be used to

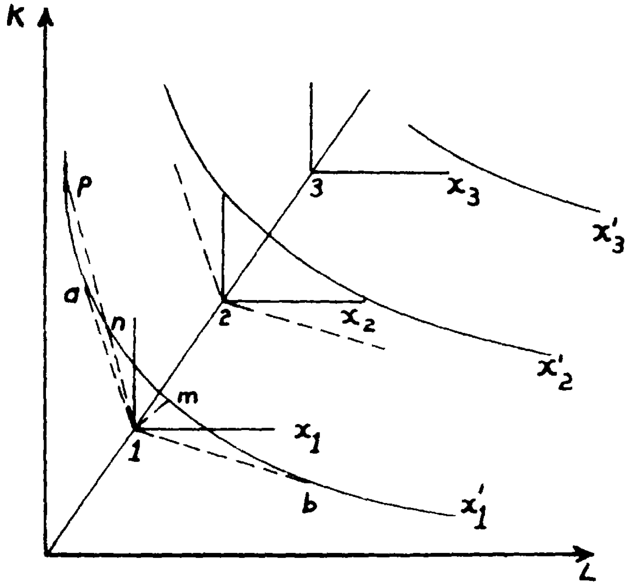


FIGURE 7

produce larger amounts than x_1. Of course, many lines like $pn1$ could be drawn between $a1$ and the vertical portion of the fixed-coefficient x_1 isoproduct line and, analogously, between $1b$ and the horizontal portion of the fixed-coefficient isoproduct line. Lines like $1m$, of which many could also be drawn, represent combinations of methods which would also produce x_1, but require more of *both* labor and capital than points on the efficiency locus. The boundaries of lines such as $1m$ are the vertical and horizontal portions of the fixed-coefficients x_1 isoproduct line.

Figure 7 embodies the constant-returns-to-scale assumption for both the fixed-coefficients and variable-coefficients method. This is not necessarily the most realistic or relevant assumption, however, nor does the relative position of the two types of curves, or the shape of the variable-coefficients isoquants necessarily correspond closely to reality. It is

useful to recognize other, special cases which may have important empirical significance. In Figure 7, for example, only the extremes of the isoproduct curves of the variable-coefficients technique were a part of the efficiency locus for any particular output, and, as drawn, relatively little substitution was possible at such extremes. It would, of course, be possible to draw figures in which the "efficient" isoproduct ridge lines follow the variable-coefficients lines so as to allow substitution of factors over a considerable range.

The effect of divergent rates of return to scale on the shape and slope of the constant-product ridge lines is illustrated in Figure 8 for

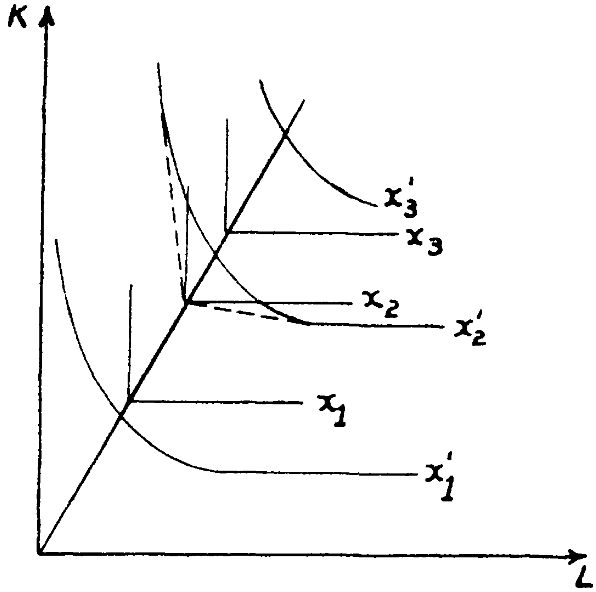


FIGURE 8

one possible set of relations. In the fixed-coefficients process it is assumed that there are increasing returns to scale (shown by decreasing distances between x_1, x_2, x_3, along any ray from the origin). In the variable-coefficients method constant returns to scale are the rule (shown by constant distances between x_1', x_2', x_3', along a ray from the origin). In this example, the efficient isoproduct lines change their shape as output is increased. For output x_1 only the variable-coefficients constant-product line is relevant. For output x_2 the "efficient" isoproduct ridge line involves use of both the fixed and variable-coefficient techniques. Finally, for output x_3, only the fixed-coefficient technique is "efficient" and the ridge lines involving the variable-coefficient method necessarily have a positive slope.

Figure 8 provides the formal basis for some useful deductions. Changes in factor prices which might at one scale of output induce shifts in the proportions in which factors are used, may not induce such shifts at another scale of output or may only produce smaller shifts. Likewise techniques of production not feasible at one scale of production may become mandatory for efficiency at another scale.

In Figures 6, 7 and 8 it is particularly clear that in order for the system to travel along its most efficient production isoquant it is necessary that factor prices be flexible. Factor price rigidities would make parts of the efficient constant-product lines unattainable for profit-maximizing businessmen.

We can now go rapidly through an analysis of the two-sector model hypothesis assuming that each sector produces a different commodity. The geometrical representation of this, using the box diagram technique introduced in the previous section, is provided by Figure 9a. The assumption that for x_1 only two alternative processes are available is maintained for convenience; the resulting production-possibility curves for x_1 are shown by the solid lines. The assumption of variable-coefficients in the production of x_2 is limited to the sector between its ridge lines because at these ridge lines the marginal productivity of one of the factors becomes zero and further input of this factor would have no effect on output.[22]

The production functions for x_1 and x_2 are reproduced in the box diagram in Figure 9b: the dimensions of the box are determined by the factor endowments.[23] Using this box diagram we can trace out the efficiency locus for the two products by repeatingly asking the question, "For a given amount of x_1 what is the maximum amount of x_2 which can be produced?" In the process of tracing out the efficiency locus, the transformation curve can be drawn for the two goods.

Starting at O_1, zero output of x_1, the maximum amount of x_2 producible is given by O_2A. If the output of x_1 is increased relative to x_2, it would be most efficient at first to use process x_1' for x_1 and to produce x_2 by traveling along its most capital-intensive ridge line, O_2A. This represents optimal behavior up to point B. In this stage although both products are being produced capital is a redundant factor. This results in spite of the variability of coefficients in production of x_2 because outside the upper ridge line of x_2 capital has zero marginal productivity. Stage 1 is represented on the transformation curve in Figure 9c as segment AB.

[22] It is assumed that there is no disposal problem and, thus, that the production isoquants do not bend back on themselves.

[23] Again only the ratio of the factor endowments is important as long as constant returns to scale is assumed.

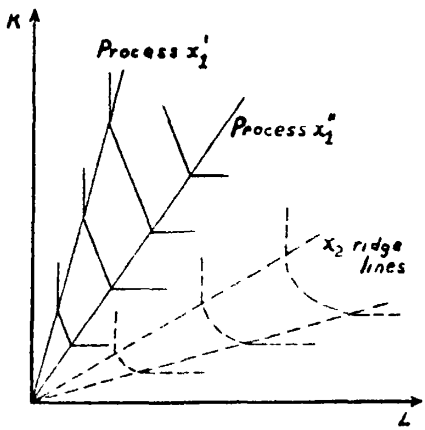


FIGURE 9A

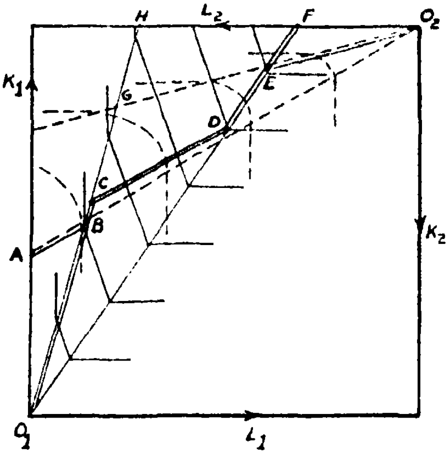


FIGURE 9B

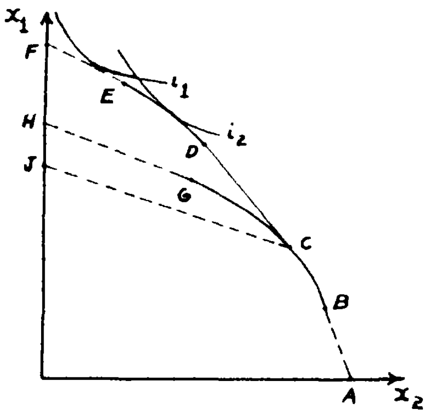


FIGURE 9C

The efficiency locus from B to C is traced out by finding the succession of points at which the x_1 constant-product curves touch the highest x_2 constant-product curves. In this stage process x_1' will be used for x_1 and a varying combination of factors for x_2. The segment of the transformation curve for this stage, BC, will be curved as equal increases in production of x_1 along x_1' will not result in constant changes in output of x_2. Only along rays from the origin O_2 will equal distances imply equal differences in output of x_2. BC will be concave to the origin as is "normal" for transformation curves; graphically it can be seen that smaller and smaller changes along x_1' are needed in order to move across equal changes in output of x_2. As production moves from B to C the points at which x_1' corners touch the x_2 isoquants will be characterized by smaller and smaller slopes on the x_2 isoquants, corresponding to the

decreasing capital-labor ratio used in the production of x_2. At some point, C, the capital-labor ratio in x_2 will become equal to the capital-labor ratio represented by the negatively slanting portion of the x_1 isoquants. A ray from the origin O_2 to point C will intersect every x_2 isoquant at a point with identical slopes. Thus CD, the third stage of the efficiency locus and the transformation curve, will be the series of tangencies of the negatively slanting portion of the x_1 isoquants, representing combinations of processes x_1' and x_1'' and the x_2 isoquants along the ray O_2C. The segment of the transformation curve corresponding to CD lies on a ray from O_2 and thus the equal jumps across the x_1 isoquants will mark out constant changes in production of x_2.

At point D and for further increases in output of x_1 relative to x_2 it would be best to use only process x_1'' for production of x_1. The segment of the transformation curve, DE, corresponding to DE on the efficiency locus, is curved for reasons similar to those which created the curvature of segment BC.

The final stage of the efficiency locus is the labor unemployment stage. The marginal productivity of labor has fallen to zero in the x_2 sector and in a perfect factor market wages would fall to zero. EF represents this final stage on the transformation curve in Figure 9c.

$ABCDEF$ in Figure 9c is the full transformation curve for this case. There are now curved as well as straight-line segments, and the kinks characteristic of the previous transformation curves have disappeared.[24]

In Figure 9b, as in Figure 5b, it is possible to visualize the effects of structural changes by altering the shape and position of the production isoquants for each product and the dimensions of the box.

The box diagram approach helps to clarify the implication of the differences in substitutability in the fixed-coefficient and variable-coefficient sectors. It is clear that the outputs at which one or another factor becomes redundant will be determined by the limits of substitution in the variable-coefficients sector and the most extreme labor- and capital-intensive processes in the fixed-coefficient sector, not by the discontinuities of the latter sector. These have other important effects, however.

Suppose that the respective demands for output are such that a large part of the available capital is drawn into the capital-intensive and fixed-coefficient sector. The amount of labor which can be absorbed in these sectors is dependent on the amount of capital available. Since capital is a scarce factor, labor employment opportunities in this sector are limited by its availability rather than by demand for output.

[24] Being off the efficiency curve, it may be noted is like being on an isoquant 1*m* in the single-good case Cf Figure 7 above.

The relatively plentiful labor supply is then pushed into the variable-coefficient sector and absorbed there as long as the marginal value productivity of labor is higher than the wages it receives.

In this case, as in the models of the preceding sections, unemployment is not due to lack of effective demand and as a result cannot be relieved by conventional contracyclical economic policy designed to stimulate spending. If employment opportunities in the fixed-coefficient sectors were limited by capital scarcity or some other resource bottleneck, an increase in demand rather than stimulating additional output would only create inflationary pressures. Likewise, in the variable-coefficient sectors if the marginal productivity of labor were zero, the first effects of an increase in demand for output would be an increase in prices without an increase in production. If more of the scarce factors were made available to the fixed-coefficient sectors, more labor could then be employed and would be used, if there were an effective demand for its output. Additional amounts of the scarce factors in the variable-coefficients sector would also increase labor productivity and output if demand were adequate.

It is possible in this case of two sectors, one of fixed and one of variable coefficients, for a divergence to exist between the full-employment output and the output with maximum value, just as in the case of fixed-coefficient processes for each of two goods, as depicted in Figure 6 above. This could result even if there were no market imperfections. If, in Figure 9c, the community indifference curves were like i_1 rather than i_2 so that the tangency occurred in the capital-scarcity, labor-surplus stage, the divergence could exist. On the other hand, community indifference curves shaped like i_2 would mean that it would be possible for full-employment output and maximum-value output to be identical. This demonstration is subject to the same qualifications applied to the one-good case.

Without empirical knowledge, it is not possible to evaluate certainly the relative importance of each of the stages of the transformation curve 9c. However, according to the hypothesis advanced here the transformation curve for underdeveloped areas would consist mainly of the high labor-intensity and labor-unemployment segments such as *DE* and *EF*.

We have thus far in this section assumed the existence of competitive markets and profit-maximizing entrepreneurs. We have shown that, even under such assumptions, technology, factor endowments and final demands may combine in ways which make it very difficult for underdeveloped areas to solve their problems of unemployment and underemployment. It is possible now to broaden the analysis by combining it with the analysis of the effects of market imperfections discussed in

Section I to determine what further problems are created when some of the assumptions of competition are dropped.

Behind the transformation curve lie many fine adjustments as factors are shifted from one industry to another and recombined in varying proportions to obtain the maximum output from one industry for given outputs of the other industry. It has been assumed in deriving the transformation curve that the necessary adjustments would be accomplished as they would be in a perfect factor market. But flexibility within wide limits is required to achieve every possible position on a transformation locus such as that in Figure 9c. When imperfections and rigidities of various types obstruct the movements of factors and prices, the system will not be able to achieve its optimum transformation curve but will instead do no better than to move along some other, less than optimal curve. Limited factor-price flexibility may be quite serious when at least one good is produced with fixed-coefficient processes. If rigid factor prices render a relatively labor-intensive process unprofitable, the only alternative process may involve a big jump to a quite capital-intensive process as well as a drastic obstacle to substitution in the variable-coefficients process.

Since we are interested in the effect of imperfections in the factor markets, it will be useful to distinguish transformation curves which assume perfect adjustments in the factor markets; these will be called "technical transformation curves." Transformation curves which take into account market imperfections will be different from the technical transformation curves; these latter relations will be designated "market transformation curves."[25] Different types of market imperfections will create different types of shifts away from the technical transformation curve, so there is not one market transformation curve for each technical transformation curve but many.

It may help to approximate reality to assume that factor-price ratios in the variable-coefficients sector are relatively more flexible than those in the fixed-coefficients sector. This might result from differential strength of union organization or susceptibility to government wage controls. Suppose, for example, that by means of union pressures or minimum wage legislation real wages of labor were maintained so that in the fixed coefficients sector the labor-capital price ratio was set above that represented by the slope of the constant product curve combining processes x_1' and x_1'' in Figure 9b; the factor-price ratio in

[25] The effect of factor-market imperfections in shifting the market transformation curve inside the technical transformation curve has been pointed out and analyzed for international trade by G. Haberler, "Some Problems in the Pure Theory of International Trade," *Econ. Jour.*, June 1950, LX, 223-40 and by P. Samuelson, "Evaluation of Real National Income," *Oxford Econ. Papers*, Jan. 1950, II (N.S.), 18-19 for welfare economics; others have probably also noted the effect.

the variable coefficients sector may still be assumed to vary freely. The cost-minimizing combination of factors is determined for any particular output at the point at which the production-possibility schedule for that output touches the lowest expenditure line. If the production-possibility schedule has any slope at this point, it is a condition of equilibrium that this slope be equal to the factor-price ratio which determines the slope of the expenditure line. As a result under the present assumptions process x_1'' would never be used. It would always be more profitable to use process x_1' alone in producing x_1. The transformation curve would be *ABCGH* in Figure 9c; this is below the technical transformation curve and has a much longer range of unemployment. If both sectors were characterized by such high, inflexible factor-price ratios, the economy's transformation curve would approach *ABCJ*.[26]

Barriers to the movement of factors would have the effect of moving the market transformation curve even further inside the technical transformation curve and increasing the range over which a factor is redundant.

Thus imperfections in factor markets have several undesirable effects. They reduce the amount of goods available and create a wider range of combinations of goods over which labor may become unemployed, depending on the structure of final demand.

Although the effects of rigid wages on the transformation curve of the economy are clear, welfare judgments as to the results of removal of the factor-price rigidities are subject to the same qualifications as in the previous case. Much depends on the effects of a change in methods on the income distribution and, via income distribution, on community preferences.

III. *Empirical Verification*

The analysis above is based on hypotheses which can be tested empirically and which deserve to be given factual content. Empirical testing requires measurement of the proportions in which productive factors can be and are actually used. Essentially the objective of such research would be an investigation of production functions.

Although the concept of the production function has been familiar for some time, its empirical investigation has, as is common, been neglected with important noteworthy exceptions. In this connection it should be noted that even though it is sometimes presented as an analysis of productive processes and its terminology is taken from the theory of production, input-output analysis, as it now stands, does not reveal

[26] Barriers to capital movement created by monopoly may create situations analogous to those described above resulting from labor-market imperfections.

the technologies actually in use in an economy. For this purpose a much higher degree of disaggregation would be necessary than is currently practiced or appears feasible. Interindustry flows may strongly reflect historical incidents by which certain technical processes are concentrated in a particular sector which subcontracts for other sectors. Or, if similar technical processes are widely used, the interindustry flows in a particular year may reflect different cyclical patterns in industry; one industry producing at its capacity may subcontract to another industry which has equipment capable of performing the necessary operations and is cyclically depressed.[27] Studies of capital coefficients made for input-output tables do indicate, however, a method which can be used for a factor proportions study.[28]

The objective of the process analysis approach newly developed at the RAND Corporation is exactly the empirical determination of production functions. The emphasis of the process analysis approach in establishing all the alternatives on a production-possibility schedule, which is essential for programming, is somewhat different from a factor proportions study. For the latter study not only the range of possibilities but the relative frequencies of their use and dynamic considerations involved in choice are important. The methods of process analysis can also be used for a factor proportions study, however.

For the study of factor proportions two general approaches seem to be available. The first, suggested by input-output studies of capital coefficients and which will be called the "product analysis" method, involves a census in each plant studied of the amounts of each type of factor of production used in the expansion of the output of a particular product. The second method, based on classifications of technical processes, requires the determination of the combinations of factors actually used by firms to perform certain standardized "tasks."

These approaches to the factor proportions study are not necessarily logically separate, nor should they always be completely different in application. The great advantage of process analysis in precise identification of outputs can compensate for the weakness of product analysis where multiproduct plants are involved. The advantage of product analysis in inclusion of all contributing inputs can be important when using the process analysis approach where it is difficult to isolate the contributions of all inputs. Thus, it is important in particular cases to have in mind a method combining both the product and process analyses.

[27] This point is made with force by H. Markowitz in *Process Analysis of the Metal Working Industries*, The RAND Corporation (Santa Monica, 1953), pp. 7-8.

[28] Esp. the studies made by the Inter-Industry Analysis Branch of the Office of Chief Economist, Bureau of Mines, U. S. Department of Interior.

The application of product analysis can be made in two ways: (1) By abstracting the data required from the engineering plans which are prepared when a new investment is undertaken and which list the construction, equipment, labor and materials required for the operation of the plant. Accounting records of new investment expenses could also supply part of the necessary information. (2) By means of "factor inventories" of existing plants to provide for these plants the information which the investment plan analysis provides for new expansions. No easy and automatic application of product analysis techniques is possible in the face of problems such as those raised by multiproduct firms and the measurement of the expansion of capacity. These problems can often be overcome, I believe, to make this a fruitful method.

Process analysis is based on the conception that all productive activity can be divided into separate technical processes with similar outputs whose inputs can be identified and compared. Process analysis thus provides another logically satisfactory approach to study of factor proportions. The process analysis approach can moreover provide the basis for a comparison of factor proportions by final products, and thus for an independent check of factor proportions computed by the product analysis method. This could be achieved by determining the appropriate physical processes and levels of activity necessary for the output of a particular final product and aggregating their factor inputs. The procedure just described is, in fact, that actually used in modern engineering practice in plant and equipment design and layout.

The disadvantage of the process analysis approach, however, stemming from the kinds of information which would be generally available, I believe, occurs precisely where the product analysis method is strong. The information for the process analysis approach must come from the records of inputs to particular processes and these records, because of the purposes for which they are kept, will seldom be sufficiently detailed and comprehensive as to the inputs involved in a process. As a result it will often be necessary in using the process analysis approach to estimate the contributions of "indirect" inputs to the processes studied.

A major source of information for the application of the process analysis approach may be the time cards kept by many firms. These cards list for each worker the time which he takes at each type of machine which he uses to perform the operations on the particular piece. These cards would have the labor inputs and machines specified for particular tasks and often contain other useful data as well. The job sheets which accompany production orders are also sources of information as they list the time per unit and in total required by each type of machine and process to finish a particular item.

IV. *Conclusions*

In this paper a number of different hypotheses have been developed and combined for the purpose of explaining outstanding features of some underdeveloped areas: the persistence of unemployment and underemployment, the coexistence of "modern" capital-intensive techniques and methods using a great deal of labor and little capital, and large differentials in factor returns in different sectors. I have suggested that to a considerable degree these conditions may be the result of a few characteristic conditions: factor-market imperfections, and limited technical substitutability of factors, with divergences between the proportions in which goods are demanded and in which they can be supplied with full use of available factors.

Factor-market imperfections which limit factor mobility create employment problems in underemployed areas with low per capita incomes and limited capital resources which are not different in kind but are much different in degree from those existing in the more advanced countries.

When the proportions in which factors can be combined are variable without limit, *i.e.*, with decreasing but always positive marginal returns to labor, additional labor can always produce additional output. If the technical substitutability of factors is limited, as is suggested here, the possibility of labor redundancy arises. Even if there are some sectors in which labor always has a positive marginal product there may be a divergence between maximum value output and full employment output if there is insufficient demand for the output of these sectors. These possibilities are again more important for the underdeveloped areas whose resource endowments are often not suited to the factor proportions dictated by the technological leadership of advanced countries. Differences in income distribution and the range of products may also make limited technical substitutability a more pressing problem in underdeveloped than in advanced areas.

COTTON MECHANIZATION AND ECONOMIC DEVELOPMENT

By JAMES H. STREET*

In formulating a general explanation of economic development, one of the central problems is to account satisfactorily for the disparate rates of growth which have taken place, not only between widely differing cultural regions, but within some of the industrially advanced parts of the world. This problem was recently stated succinctly by Theodore W. Schultz:

> In taking the long view, it is, of course, patent that economic development has occurred very unevenly, not only among countries and major parts of the world but also among communities within an economy or country. The very unevenness of this development presents two basic questions: What particular circumstances give rise to the process of economic development? Why does this process occur so unevenly, more especially, why does it by-pass entire communities within an economy, say within a country having well-established internal trade and migration?[1]

Schultz cites the American South, among other regions, as an example of a community which has been by-passed in this manner, and attributes the lag in economic development of the region primarily to its location relative to industrial-urban centers. The discussion which follows, while not denying a degree of significance to the factor which Schultz emphasizes, seeks to take a more comprehensive historical and theoretical approach to the problem. This paper summarizes the results of a study of the long retardation, followed by a recent sharp acceleration, in the application of mechanized methods of production in the cotton region of the southern United States. (It should be observed that this region does not coincide precisely with the South as a cultural region, though most of the welfare problems associated with cotton production have been concentrated in portions of the Old South. Moreover, while cotton is losing its relative importance as the dominating enterprise in the South, the conditions under which it is produced still exercise a major influence in the rural parts of the region.)

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[1] *The Economic Organization of Agriculture* (New York, 1953), p. 148

An examination of one historical case hardly establishes the basis for a general explanation of regional economic retardation and acceleration; yet it is the writer's belief that the analytical categories applied in this instance, as well as certain of the conclusions, may be useful in considering other cases with similar characteristics. The analysis utilizes three groupings of forces: (1) institutional, (2) technological, and (3) exogenous factors in the process of development. Institutions, while they organize the activities of the community, are in general characterized by inertia and the tendency toward self-perpetuation. Technology, which includes improved theoretical conceptions and productive methods as well as mechanical devices, has a dynamic impact upon existing methods of production and is the chief source of conflict with existing institutional arrangements. Exogenous factors must be considered separately because a regional economy will at times be importantly affected by events originating independently outside the region.[2]

I. *The Cotton Region as an Underdeveloped Area*

The introduction of cotton-growing as a major farming enterprise and regional source of income during the postcolonial period of American development took place under conditions unusually receptive to rapid growth and technological improvement. Events in the raw-materials-producing New World during this period were closely linked to the Industrial Revolution abroad, and for a time partook of the same innovating spirit. While most American crops underwent an extended period of production under conditions of diversified, self-sufficient farming from which they emerged gradually to fill the increasing needs of an urban market, cotton came into its own as a commercial crop almost overnight. As a substitute for the declining tobacco, indigo, and rice enterprises, cotton found waiting for it an established plantation economy with overseas trade connections ready to exploit a new com-

[*] This article is based on a larger study scheduled for publication in 1956 under the title *The New Revolution in the Cotton Economy*. The present study relies for its basic conceptions primarily upon two sources, the respective analyses of economic development of C. E. Ayres and Simon S. Kuznets. Ayres' penetrating description of the institutional and technological aspects of economic change has been brilliantly set forth in *The Theory of Economic Progress* (Chapel Hill, 1944). Ayres' theoretical framework seems to have been unduly neglected thus far by writers on the theory of economic development. Kuznets' contribution to the factorial method of historical analysis is perhaps more widely known; but his perceptive classroom treatment of the general process of economic development has not appeared in print. The method is exemplified in an early essay on "Retardation of Industrial Growth," recently reprinted in *Economic Change: Selected Essays in Business Cycles, National Income, and Economic Growth* (New York, 1953). The writer must of course accept the responsibility for whatever deficiencies result from the attempt to fuse analytical methods derived from two such vigorously independent minds.

mercial opportunity. The burgeoning British textile industry provided a seemingly insatiable demand for raw cotton, whose spinning and weaving properties surpassed those of wool or flax on the early power-driven spinning machines and looms.

The initial expansion of cotton-growing took place in India and the West Indies, rather than the American South, since the former were more plentifully supplied with hand labor. Two early instances of technological innovation, however, enabled American production to take the lead. The first of these was the invention of the cotton gin. Within two years after the advent of Eli Whitney's saw gin in 1793, and despite his strenuous attempts to establish monopoly control over his invention, gin stands had been set up as far west as the Mississippi, then on the frontier of cultivation. By 1796 Whitney and his partner, Phineas Miller, were operating thirty gins in Georgia alone. Within a decade American cotton output increased eightfold, and sea-island cotton was largely supplanted by the short-staple upland varieties which Whitney's invention made it economically feasible to prepare for market.

A second innovation, hardly less important than the invention of the cotton gin, was the introduction of the Mexican or Petit Gulf variety of cotton to replace the earlier varieties, which were subject to rot and had deteriorated both in yield and quality. The superior Mexican cotton was observed by General James Wilkinson on a mission to Mexico City around 1814. He is said to have evaded the Spanish viceroy's ban on seed exports by stuffing some rag dolls intended for his nieces with the coveted cottonseed and thus smuggling it into Mississippi. The widespread adoption of this variety increased yields sufficiently to permit doubling the amount of cotton that could be picked by a hand in a day.

Short of the development of a few mule-drawn planting and cultivating implements, none of which reduced total labor requirements significantly, there was no other noteworthy improvement in methods of cotton production for well over a century. The invention of the cotton gin merely shifted the acute need for an adequate supply of hand labor from the ginning shed to the field, where two severe seasonal bottlenecks prevailed: the labor needed for weed control and the labor for harvesting. Historically the problem was of course met by the greatly increased importation and domestic breeding of Negro slaves.

A thoroughgoing mechanical solution for this set of problems has been achieved only very recently and as yet in limited areas. Nevertheless, in the 1953 season 22 per cent of the American cotton crop was harvested by machine, and in California machines harvested 59 per

cent of the crop.[8] This is not the evidence, but rather the symbol, of the change. Equally significant is the fact that virtually every other stage of the crop has recently been brought under mechanical control. Total mechanization has become technically feasible only by virtue of a remarkable concurrence of developments in plant breeding, weed control, plant defoliation, and cotton ginning, as well as in perfecting satisfactory mechanical harvesters, of which there are now several distinct types on the market. The introduction of these techniques in combination promises to have profound effects on the economy and the social institutions of the rural South.

The current revolution in production methods may be construed as a belated attempt to catch up with similar movements that occurred earlier in other agricultural enterprises as well as in industry. The lag in economic progress in the Cotton Belt is the more remarkable when one considers that the region has shared with the rest of the country a common language, a common culture, common political institutions, and, increasingly with the years, a considerable interchange of population. Why was the new revolution so long in coming?

The answer appears to be that the American cotton region has shared in an important degree some of the characteristics which are now generally recognized in many industrially underdeveloped parts of the world. These may be summarized as follows:

1. *An intense and highly specialized commercial exploitation of a basic extractive industry requiring little capital investment at the outset, and utilizing abundant undeveloped resources in combination with large quantities of unskilled, routinized labor.* In the case of the South, unlike the typical colonial area, it was not indigenous labor which was so utilized: yet the transplanted African natives who became the American slaves were culturally so primitive and racially so easily distinguished as to lend themselves to ready exploitation under what amounted to a colonial system. It was thus in effect possible to create in the South a labor situation not greatly different from that pre-existing in the more heavily populated colonial areas of the world.

It should be recognized as a point of dissimilarity that the political independence of the American colonies after the Revolutionary War curtailed the opportunity and the incentive for some of the extreme instances of colonial exploitation recorded in those areas that served only to feed the economic interests of a mother country. Furthermore, in the American cotton region the growth of a free white population

[8] U. S. Agricultural Marketing Service, *Charges for Ginning Cotton, Costs of Selected Services Incident to Marketing, and Related Information, Season 1953-54* (Washington, processed, May 1954), p. 2.

which could not be held in check by such devices as the exclusive crown grant likewise permitted an infiltration of yeoman farmers who gave the region a somewhat mixed institutional complexion. Even so, the interests of the dominant groups within and without the South were for a long period not oriented toward a balanced economic development of the region, but toward a perpetuation of the policies identified with colonialism. Commercially, the Cotton South was a colony of the Manchester mills long after the Revolutionary War.

As the economy of the United States became more closely integrated, especially after the Civil War, the South merely tended to shift its complementary relationship of specialization and exchange to a new locus of attachment. Such rail and other transport facilities as were constructed facilitated the maintenance of distinctly industrial and agricultural sections of the country. Though this arrangement was actively promoted by Northern financial and industrial interests and was at times heatedly protested in the South, it was reinforced at almost every point by southern commercial institutions and long-standing habits of thought.

As is well known, the overspecialization represented by the one-cash-crop system (which was not confined to cotton in all parts of the South), led to wasteful depletion of the soil. Because land was cheap and the principal investment was in chattel slaves, the practice arose of "killing the land" of its virgin fertility and moving westward—a practice which was continued long after slavery was abolished. Thus were created cost differentials between the older and the newer parts of the region which have never been overcome.

In light of the increasing diversity of farm enterprises in the South, one wonders at the long insistence that only cotton (or, in certain localities, only tobacco, rice, or sugar cane) could be successfully produced. While it is true that recent changes, such as the growth of urban population, changing dietary habits, improved transport, and other factors have fostered increasing variety in farm enterprises, the fact is that amazingly little attention was given to alternative possibilities until very lately. One is tempted to draw an analogy between the tendency toward economic overspecialization and the principle of evolutionary overspecialization in biology.

2. *The organization of appropriate institutions of control.* These consisted principally of the plantation system; slavery and its successor, the sharecrop system; and the local credit system, with its reliance upon the crop lien and the landlord's "furnish," or advance to the tenant on the prospective crop. All of these are too familiar to require description here, but it is important to note their combined effect on the pattern of income distribution, the maintenance of a stable and abun-

dant labor supply under absolute control, and the mutual reinforcement of the institutional pattern.

The plantation system entailed certain efficiencies which have been well described by Lewis Cecil Gray.[4] These were not, however, primarily economies of scale such as are associated with technologically determined large-scale industry or modern large-scale farming. There are plantations in the South today (though they are rapidly disappearing) that are operated as clusters of small-scale units under virtually independent management as far as the process of production is concerned. The chief advantage of the plantation system stemmed from the powerful means of institutional control over labor, and hence over the distribution of income, which it afforded.

The sharecrop system which emerged to replace slavery after the Civil War was a change in form but not in substance, since its chief purpose was to insure the stability of the labor supply. The local credit system tended to insure the preservation of the one-crop system because credit was hardly available for any other purpose, and by imposing systematic indebtedness on the tenant groups it helped to maintain the existence of a servile, illiterate laboring class regarded as essential to the production of the cotton crop.

This had several unfortunate "boomerang" effects on the South. It meant that during depressed periods in the cotton markets (as in the 1840's, the 1890's, and the 1930's), when it might have seemed desirable to shift to some other form of production, the lack of versatility of the labor force and the rigidity of the credit system impeded such shifts. It meant that immigration into the region by European groups such as those who settled in the Middle West was discouraged, since the new arrivals did not want to compete with slaves and sharecroppers. In the few instances when such migrations took place, as in the case of the German and Bohemian settlements in central Texas and in Alabama, these communities remained culturally isolated islands seemingly unable to influence the general pattern of agriculture even though they successfully practiced general farming of the yeoman type. Finally, it meant that there was little attraction to industry to enter a region where the general income level was so low and the regional economy so dependent on the fortunes of a single enterprise.

3. *Demographic characteristics of a predominantly rural culture which has begun to be affected by technologically more advanced areas.* A commonly noted characteristic of pre-industrial communities is the tendency for the net survival rate to rise as the death rate declines under the influence of modern sanitation and medicine while the birth

[4] *History of Agriculture in the Southern United States to 1860*, 2 vols (Washington, 1933), Vol I, pp. 301-03, 478-79

rate, primarily subject to older habit patterns, falls more slowly. This interesting interplay of technological and institutional forces is reflected in the South, whose rural birth and death rates (particularly among Negroes) have been among the highest in the country. Rupert B. Vance has estimated that during the period 1920-1941 the rate of natural increase in the eleven southeastern states was so great that it would have required an annual net outflow of over 250,000 migrants merely to maintain a stable population.[5] Any reduction in the outflow, such as occurred during the depression years, tended to intensify the problem of providing employment for the increasing population in a predominantly rural region. The result has been a chronic tendency for the South to oversupply itself with farm labor, leading to unemployment and substantial, though less apparent, underemployment.

4. *A failure to make vigorous use of available technological alternatives to customary production methods.* This generalization is more difficult to substantiate than the three preceding, since it is impossible to devise a norm for maximum utilization of available technology, and since there are unquestionably many factors other than mere reluctance to use the inventions that have been made which influence the rate of technological innovation. In the case of cotton production a complex series of technical obstacles had to be overcome before complete mechanization could be regarded as practicable. Cotton as a plant lacks the uniformity and cultural simplicity of the cereal crops and hence must be handled with more complicated equipment. In addition, the sort of technological borrowing which took place in the long stream of inventions from McCormick's reaper to the modern self-propelled grain combine was for the most part not available to the inventors of the cotton picker. Furthermore, the pattern of a resident labor force which had been established in the South made it unsatisfactory to mechanize the harvest without simultaneously providing a solution to the weed problem.

Notwithstanding these considerations, however, it is also fairly clear that the rate of innovation can to some degree be forced by active research and by the vigorous sponsorship of the more enterprising producers in an industry. The development of a successful cotton harvester was hardly delayed for lack of ingenuity and painstaking investigation on the part of aspiring inventors. Most of them received scant support. The principle of the cotton stripper, now widely used in the High Plains of Texas, was known in 1874, but did not arouse serious interest until the critical crop year of 1926, and thereafter only intermittently until the reduction in migratory labor during the second

[5] *All These People* (Chapel Hill, 1945), p. 131.

world war made a technological solution imperative. Roughly prepared cotton, which had previously been unacceptable at the gins and which had entailed an intolerable amount of waste when hand labor was plentiful, now was perforce accepted by farmers, ginners, and spinners alike, even though the latter two groups had to devise special methods to handle it.

The history of the development of the spindle picker, now used extensively in California and increasingly in other irrigated or rain-belt cotton, reveals similar aspects. Angus Campbell, whose pioneer work in the early part of the century established the basis for the machine ultimately put on the market by the International Harvester Company in 1948, spent 37 years working on his invention until his death in 1922. Each harvest season for over twenty years he used his annual vacation time to travel from Chicago, where he was employed by the Deering Harvester Company, to one of the cotton states to try out his latest model. Thus he could engage in only a few brief field trials each year, without access to adequate nearby shop facilities for modifications on the spot. Apparently there was little interest in his efforts, although the principles he worked out later proved to be of fundamental importance. L. C. Stuckenborg, John F. Appleby (the inventor of the twine binder), and Hiram N. Berry also spent long periods working on machines of considerable ingenuity, but with limited backing. John D. Rust, who in association with his brother Mack is generally credited with having devised the first successful spindle picker, conceived his machine in 1927 and had a working model in 1931, but did not see it in commercial production until 1949.

Each inventor was forced in time to realize that there was little prospect for the adoption of a mechanical harvester that would do only a passably good job. It was necessary for the machine to be ***highly*** efficient in the quality of the product it turned out and *overwhelmingly* labor-saving in comparison with hand picking. It must be acknowledged that when the Rust brothers were finally able to develop such a machine, the delay in its commercial introduction was to some degree deliberate on their part. Wishing to avoid the indiscriminate displacement of farm labor that might result from marketing their machine in the conventional way, the Rusts sought for years to safeguard its introduction by devices that would spread its labor-saving benefits among small farmers and tenants, and thus they lost the lead in getting the spindle picker onto the market. (Machines embodying Rust patents are presently being manufactured by two companies under nonexclusive licenses.)

The process of innovation is a complex one fraught with fortuitous

TABLE I.—NUMBER AND PERCENTAGE CHANGE OF FARM TRACTORS, UNITED STATES AND TEN COTTON STATES, 1920–1950

	Number of Tractors on Farms*						Percentage of Increase over Previous Date				
	1920 Jan 1	1925 Jan 1	1930 Apr 1	1940 Apr 1	1945 Jan 1	1950 Apr 1	1920–1925	1925–1930	1930–1940	1940–1945	1945–1950
United States	246.0	505.9	920.0	1,567.4	2,421.5	3,609.3	106	82	70	55	49
Nonsouth	209.6	426.1	774.2	1,295.9	1,923.4	2,687.0	103	82	67	48	40
North Carolina	2.3	7.9	11.4	12.8	31.2	73.5	247	45	12	145	136
South Carolina	1.3	2.9	3.5	4.8	12.4	30.3	123	19	38	160	144
Georgia	2.3	4.1	5.9	9.3	24.6	60.3	84	42	59	164	145
Tennessee	1.9	4.8	6.9	11.8	24.1	59.8	155	44	72	104	148
Alabama	.8	2.5	4.7	7.6	17.1	45.8	204	89	64	123	168
Mississippi	.7	1.9	5.5	10.6	21.1	51.7	181	196	91	99	145
Arkansas	1.8	3.5	5.7	12.6	26.5	60.3	91	64	121	111	128
Louisiana	2.8	3.5	5.0	9.5	17.6	35.7	24	44	89	86	103
Oklahoma	6.2	11.0	26.0	45.4	70.4	93.7	76	137	75	55	33
Texas	9.0	16.8	37.3	98.9	162.4	232.3	86	123	165	64	43
Ten Cotton States	29.1	58.8	111.9	223.3	407.4	743.4	102	90	100	82	83
Percentage in Cotton States	11.8	11.6	12.2	14.2	16.8	20.6					

* In thousands. No census of tractor numbers was taken in 1935.

Source: U. S. Bureau of the Census, *U. S. Census of Agriculture: 1950*, Vol. II, *General Report, Statistics by Subjects* (Washington, 1952), Table 15.

elements. It is the writer's belief, however, that for at least the period since the advent of the tractor the stultifying effect of southern social and economic institutions has been a greater factor than the existence of technical difficulties in explaining the slow rate of progress in the mechanization of cotton production and the lag in the general rationalization of southern agriculture as well. The overriding circumstance in this process has been the availability of a routinized, poorly educated, and politically ineffective rural labor force which for a long period rendered sustained inventive and developmental interest in labor-saving farm machines economically pointless. Until the existing population distribution and the institutional structure embracing it were seriously jarred by the impact of outside events, there was an irresistible predisposition to try to solve the problems of the cotton economy by institutional expedients rather than by technological reorganization.

II. *The Process of Accelerated Change*

The past decade has witnessed a striking increase in the adoption of mechanized methods of production in southern agriculture. In considering cotton production, a distinction must be drawn between partial mechanization, which signifies the introduction of the tractor without a notable reduction in total labor requirements, and complete mechanization, which entails sufficient additional equipment to reduce greatly the man-hours required in the twin bottlenecks, cultivation and harvesting. Complete mechanization will not necessarily follow closely on the heels of partial mechanization, but the latter is often a transitional stage toward the former.

It is therefore highly significant that the number of farm tractors in the ten leading cotton states (excluding California, Arizona, New Mexico and Missouri) rose from 223,300 in 1940 to 743,400 in 1950, an increase of 233 per cent, as compared with a national increase of 130 per cent and an increase in the Nonsouth of 107 per cent. The highest rates of increase were in the southeastern states, where there were relatively few tractors in use prior to the second world war (see Table I). The southwestern states had already experienced substantial rates of increase in tractor numbers during the prewar decade, but continued to add tractors at rates higher than the Nonsouth during the succeeding decade. As a result of these increases, the ten specified cotton states had 20.6 per cent of the tractors in the United States in 1950, as compared with 14.2 per cent in 1940.

Statistics on the newer types of machines are less readily available, but it is estimated that there were about 18,500 mechanical cotton

strippers and 15,500 spindle pickers available for use by 1953.[6] The former had not begun to appear in commercial quantities until 1944, and the latter until 1948. The pattern of introduction of these machines is suggested by Table II, which is based on ginners' reports. It shows that California cotton raisers have led the field in degree of mechaniza-

TABLE II.—PERCENTAGE OF COTTON CROP MECHANICALLY HARVESTED, UNITED STATES AND BY COTTON STATES, 1945–1953[a]

Area	1945	1946	1947	1948	1949	1950	1951	1952	1953
United States	1	b	2	3	6	8	15	18	22
Southeast	b	b	b	1	b	b	2	2	5
Alabama					b	b	b	1	3
Florida					0	0	1	4	12
Georgia					b	b	2	3	6
North Carolina					b	b	1	1	3
South Carolina					1	b	3	1	7
Virginia					0	0	0	0	0
Mid-South	1	b	b	2	2	2	4	6	13
Arkansas					1	1	2	2	9
Louisiana					b	3	11	13	34
Mississippi					4	3	3	7	13
Missouri					2	b	1	6	13
Tennessee					b	b	b	1	1
Southwest	3	2	6	6	10	12	18	22	24
Oklahoma					2	6	13	17	19
Texas					11	12	19	22	24
Far West	b	1	b	6	9	23	41	50	53
Arizona					4	9	26	46	54
California					13	34	53	59	59
New Mexico					3	1	7	12	15

[a] Includes machine picking and machine stripping Data by states not available before 1949.

[b] Less than 0 5 per cent.

Source: *Charges for Ginning Cotton, Costs of Selected Services Incident to Marketing, and Related Information*, annual reports for indicated years issued by Agricultural Marketing Service (formerly, Production and Marketing Administration), U S Department of Agriculture, Washington.

tion. They harvested 59 per cent of their crop mechanically in 1952 and 1953. Arizona ranked second with 54 per cent in 1953. Texas ranked fourth in percentages (24 per cent), but this represented nearly as much cotton as was mechanically harvested in California. Much of the Texas cotton was harvested with strippers, while the California and Arizona cotton was harvested principally with spindle pickers. The

[6] Estimates prepared by the National Cotton Council of America, Memphis, Tennessee, on the basis of production data provided by manufacturers, and allowing for obsolescence on earlier models.

spindle picker is also coming into significant commercial use in the alluvial areas of Mississippi, Arkansas, Louisiana, and the boot-heel of Missouri, where large fields of high-yielding cotton predominate.[7]

The factors which seem to have been most directly responsible for the recent acceleration in cotton mechanization are (1) the "shaking up" effect of the second world war on the cotton economy, (2) the simultaneous fruition of inventive effort, and (3) the receptive institutional climate in the newer cotton areas.

1. *The effects of the second world war on the cotton economy.* The second world war, which must be treated as an exogenous influence on the cotton region, created highly disturbing effects which for a time severely intensified the uncertainty of producers' decisions. At the same time, however, it brought certain benefits which may be attributed to the general "shaking up" received by the enterprise.

The initial effect of the outbreak of hostilities in Europe in the fall of 1939 was unfavorable to cotton. Exports fell off sharply, and although domestic consumption rose to unprecedented heights after the United States entered the war, surpluses began to pile up in nearly all cotton-producing countries to the extent that, at the beginning of the 1945 crop season, the world carry-over reached 26½ million bales. This carry-over, an all-time record, was equivalent to one year's normal world growth and consumption. Of the total, 45 per cent was American cotton.

Cotton acreage in cultivation declined almost continuously from year to year during the war, yet yields proved exceptionally high, and average annual production in the United States for the 1940-1944 period was about what it had been in 1938 and 1939. A considerable number of southern farmers were induced to make radical enterprise adjustments during these years, such as entering feed and livestock production, and many of these shifts were preserved during the postwar period.

The war also had severe effects on farm population. The combined result of military inductions, migration to other regions, and movement from farm to nonfarm areas was the sharpest reduction in farm population ever witnessed in this country within a similar period. The South was the region with the heaviest losses, experiencing a 20 per cent decline in farm population from 1940 to 1945. Nearly half of the decline took place within one year (1942).[8] Although there are grounds

[7] As will be noted below, a considerable variety of additional equiqment is needed to achieve complete mechanization, but reliable figures on the manufacture and distribution of this equipment are not readily available.

[8] U. S. Agricultural Marketing Service, *Farm Population: Annual Estimates by States, Major Geographic Divisions, and Regions, 1920-1950 and the United States, 1910-1950* (Washington, 1953), pp. 12-14.

to question whether this population outflow was sufficient to create a condition of actual labor unavailability on cotton farms in the South after the postwar readjustments had taken place, the large and rapid shifts of population during the war years undoubtedly had an unsettling effect on producers who had traditionally depended on an abundant supply of low-cost resident labor.[9]

The pessimistic outlook for cotton at the end of the war was further aggravated by the knowledge that synthetic fibers had made heavy inroads on long-standing markets for cotton (particularly in the automobile tire industry), and by the widespread belief that there would be a business recession in the United States following the war. These and related considerations led the Pace Committee to conduct an intensive investigation into the postwar problems to be faced by the cotton enterprise and to sponsor a broad research program later reflected in the Research and Marketing Act of 1946.[10]

Paradoxically, in the face of these discouragements, some of the more favorably situated cotton farmers found it possible to undertake partial mechanization for the first time during the war years. For this an increasingly favorable price-cost relationship was chiefly responsible. Although southern farm incomes remained low in comparison with those in other regions and pursuits, they rose greatly relative to what they had been. And notwithstanding the fact that tractors rarely relieved the most pressing labor stringencies on the farm, there was a strong impetus to begin to catch up with the more "progressive" farmers who owned tractors. The war thus caused many operators who had previously not seriously entertained the idea of converting their farms to become machinery-minded.

Postwar developments contributed to this possibility. The record carry-over of 1945 was worked off in a surprisingly short time, as a result of short crops in 1945 and 1946 and an unexpectedly high demand for cotton both at home and abroad. The latter resulted from the sustained high level of consumer incomes and the government's various foreign-assistance programs. The Korean outbreak prolonged the period of unusual consumption rates for cotton and the price rose so rapidly as to lead to the imposition of a ceiling on the price of raw cotton for the first time. These factors created an unusually favorable climate for the sale of farm machinery in the Cotton Belt.

2. *The simultaneous fruition of inventive effort.* It has often been

[9] See the writer's "The 'Labor Vacuum' and Cotton Mechanization," *Jour. Farm Econ.*, Aug. 1953, XXXV, 381-97.

[10] U. S. House Committee on Agriculture, *Study of Agricultural and Economic Problems of the Cotton Belt*, Hearings before the Special Subcommittee on Cotton, 80th Cong., 1st Sess., 2 parts (Washington, 1947)

pointed out that the development of a satisfactory cotton harvester would not in itself be likely to lead operators in the humid parts of the cotton region to mechanize, in view of the important secondary bottleneck of weed control. So long as it was necessary to maintain a resident labor force for weeding and thinning, it was argued, the same labor could be used for hand picking. To displace it by machines only in the peak season would be both uneconomic and hazardous to the crop if the labor should leave for fuller employment elsewhere.

The past few years, however, have seen a great variety of distinct approaches to weed control culminate in a concerted and largely successful attack on the problem. By various combinations of available methods—which include planting to a stand, cross cultivation, use of the rotary hoe, sweep cultivation, flame weeding, and application of pre- and post-emergence chemical herbicides—it is now possible, or shortly will be possible (depending on the area), to reduce cultivation to a mechanical process.

The cumulative character of technological development is further illustrated by the fact that new varieties of cotton are now being bred to facilitate the use of mechanical harvesters; chemical defoliants are used to remove the plant leaves before picking; a topping machine is used to reduce the size of rank cotton on irrigated land; gins have been redesigned to dry and clean mechanically harvested cotton; and spinners are adapting their methods to utilize the modified product. Nearly every one of these achievements represented a formidable obstacle a few years ago, but problem after problem has responded to research once a strong conviction became established that mechanization was on its way.

The labor-saving aspect of total mechanization, where it has been put into effect, is substantial. In the Mississippi Delta under the traditional system of mule power and half-row equipment, with all weeding, thinning and picking done by hand, approximately 155 man-hours of labor have been required to produce a bale of cotton. By mechanizing as completely as possible with equipment available in 1950 (tractor land-preparation, rotary hoe, flame weeder, and spindle picker) this could be cut to 30 man-hours, which allows for some hand labor to remove weeds in wet seasons. When an assured method of weed control is developed, it is expected that the labor requirement to produce a bale of cotton in this locality can be reduced to ten or twelve man-hours.[11]

3. *The receptive institutional climate in the newer cotton areas.* In surveying the Cotton Belt, one cannot fail to observe that the most

[11] Grady B. Crowe, "Farm Mechanization Research in the South," *Agric. Econ. Research,* Jan. 1951, III, 6.

rapid rates of introduction of full mechanization are occurring in the newer areas of the Far West and Southwest. These are in general more productive areas than most of the older cotton region, and they are less subject to the weed problem. However, more significance probably attaches to the fact that, as younger areas, they have escaped the encrustation of institutions which has inhibited change elsewhere. Since sharecropping never became established here, there have not been the problems of excessive resident population, small farm units, and depleted soil associated with this system in the Old South. When the usual numbers of migratory workers failed to appear in the High Plains during the war years, farmers almost immediately set about devising mechanical alternatives in the local blacksmith and welding shops. It is significant that the smaller farmers, who were least able to attract migrant workers, were prominent in this movement.

There are other, less tangible, indications that southwestern farmers have not been as tradition-bound in their attitude toward newer methods of farming. Part of the explanation no doubt lies in the circumstance that, having more resources, farm operators in the western parts of the belt had larger cash incomes and therefore greater flexibility in trying new methods. But the fact remains that in the older cotton areas even the larger, well-financed operators on good land did not as a group show the same aggressiveness in promoting mechanization that was already evident in the West before the war, and only recently have their attitudes been changing.[12]

Some highly significant transitional changes in tenure arrangements have been taking place in the Southeast and Mid-South as plantation operators have entered the era of partial mechanization. Most of the larger farms were formerly operated with sharecroppers, but increasingly some combination of share and wage hire is used. Under one type of transitional arrangement, each cropper family is given a small sharecrop, insufficient to provide adequate income for the year, but intended to induce the family to remain located on the farm and to see the crop through. For the remainder of its income the family is dependent on work for day wages. This arrangement has the advantage for the employer that it provides relative stability of the labor supply while not obligating him to provide continuous employment for the entire force. Thus it lends flexibility to his operations as mechanization is introduced by degrees.

Another device is based on the old practice on some plantations of

[12] A few operators have been notable exceptions. Their willingness to experiment and to incur losses with the early machines was important in the ultimate adaptation of these techniques to local conditions.

working the land "through and through," or under a gang system directed by an overseer. Each family is assigned a definite crop acreage, but instead of tending individual plots, all hands work the plantation land in common. This facilitates the use of tractors for ground breaking and seedbed preparation, followed in some instances by mechanical planting and cultivation. Since the planter thus increases his share of the production inputs, he may charge his croppers service fees for the operations performed with power equipment, or change the share ratio from the traditional 50-50 to a 60-40 basis. A few of the tenants are provided with preferred employment as tractor drivers or mechanics at day rates considerably higher than those prevailing for ordinary labor.

A third variation divides the plantation force into two parts: (1) a basic crew sufficient to insure weed control, stabilized on the farm by being assured a sharecrop; and (2) the remainder of the employees, who are on a wage status and whose employment fluctuates with the demands of the season and the year. The members of the latter group have little job security and are most readily detached as mechanization reduces the need for hand labor or as alternative opportunities pull them away from the farm.

These transitional arrangements reflect the reluctance of a number of farm operators to commit themselves wholly to a wage system and a permanently reduced labor force until they "see where mechanization is going." In some cases they have been compelled to alter traditional arrangements by the departure of farm workers for other employment; in other cases the changes are cautious voluntary ventures into the uncertainties of a radically different way of farming. Here and there an operator makes the final plunge into complete mechanization and replans his operations throughout. Vacant tenant houses are pulled down, farm lay-outs are consolidated, the training of a technically competent labor force is undertaken, and every operation from residue disposal of the old crop to the harvesting and processing of the new crop is planned with mechanized handling in mind. This is indeed a great change, and once made it is virtually irreversible.

It is doubtful whether such methods as these can be effectively used on the very small farms still to be found in many parts of the South, though it does not follow that only the large factory farm can become efficient. It is clear in any case that complete mechanization requires a considerably higher degree of technical and managerial skill than has characterized cotton production in the past. This will undoubtedly intensify the competitive strains within the enterprise between low- and high-cost producers, and will thus pose some difficult questions for public

policy. But at the same time it should significantly increase the productivity of farm labor, with all that that signifies for increased standards of income and welfare within the region.

III. *Conclusions for Theory*

The process of mechanization now under way has many implications for the cotton enterprise which cannot be elaborated here. Nor has it been possible to take adequate note of the many other changes simultaneously taking place in the regional economy of the South, one of the most significant of which is the growth of nonagricultural industry with its increased alternative economic opportunities for farm labor. Limited as the investigation is, however, it serves to illustrate that, after due allowance for exogenous influences has been made, the same forces which affect rates of growth in larger economies may explain differences within and among regional enterprises.

The first of these forces is the power of institutions to inhibit progressive change even though they may afford a liberalizing environment at the onset of a period of innovation. While the tendency of institutions to rigidify into a complex structure of mutually reinforcing controls has been documented in countless instances, it is surprising how often this aspect of economic development is overlooked or lightly dismissed in theoretical discussions of factors making for differential rates of change. Now that induced economic development is the order of the day, a study of the circumstances under which institutions become permissive of change must be accorded a place in the strategy of planning. Lately it has become the special province of anthropologists to advise economists, administrators, and technicians in this area, as it was once their role to call attention to the problem.[13]

The second, and in general initiating, force is the compelling quality of technological innovation which, though it may be long delayed by technical circumstances or inhibiting institutions, inevitably forces adjustments in such institutions. This is especially likely to happen when simultaneous inventions and improvements from a variety of sources come together in such a way as to supplement each other with explosive force.[14] The case of cotton production also emphasizes the importance of the opportunity (or absence of opportunity) for technological borrowing in speeding up the process of invention. This is but an aspect of the general principle of technological continuity.

[13] *Cf. Cultural Patterns and Technical Change*, edited by Margaret Mead (Paris, UNESCO, 1953).

[14] The Industrial Revolution in England is the outstanding example of such a combination of previously unrelated elements. Ayres has shown the significance of the same process as it occurred in printing and shipbuilding, *op. cit.*, Ch. 7

The third force, particularly applicable to preindustrial communities, is what may be called the unassimilated population factor. A high rate of population growth, which is itself a result of previous technological influences in combination with a lag in institutional adjustments, may inhibit further economic improvement. Kuznets has commented on the difficulty of inducing industrialization in areas with a very high population density such as the Far East, where the sheer mass of humanity limits the expansion of transportation and related facilities. American experience has shown that even much more moderate differentials in population density and growth may have significant regional effects. The strategy of planned development requires attention to population relocation both in respect to the effects on the migrants and to the effects on retarded enterprises. Our experience with rural resettlement and land-use planning in the 'thirties illustrates the complexity of these problems.

It must be emphasized in conclusion that it has not been the purpose of this paper to draw a close historical parallel between conditions in the American cotton belt and those in regions of differing cultural and geographic characteristics. Rather the aim has been to utilize the wealth of statistical and other descriptive data which are now available with regard to one area to arrive at the most general considerations which may have application to other areas. In each region the special circumstances and events will no doubt be different, while the contending forces are essentially the same.

SPATIAL EQUILIBRIUM MODELS OF THE LIVESTOCK-FEED ECONOMY

By Karl A. Fox and Richard C. Taeuber*

During the past three or four years several articles have appeared on the theory of spatial equilibrium.[1] So far, however, only one empirical application seems to have been published.[2]

The closely related "transportation model" has won a prominent place in the linear programming literature and has been applied successfully to the shipping problems of some industrial concerns. In this model, specified quantities of a commodity are to be shipped from each of a number of sources and other specified quantities are to be received at each of a number of destinations, total receipts being equal to total shipments. The receipts at each market are determined in advance and do not depend upon price. The objective is to satisfy the set of destination requirements at the least possible total transportation cost. The "contract award model" is quite similar except that total supplies at shipping points exceed total destination requirements, and the problem is to allocate purchases in such a way as to fill destination requirements at the lowest possible total delivered cost (f.o.b. cost plus freight). This model has been applied successfully to some purchasing programs of the federal government; and similar problems must arise in the procurement operations of private concerns.

The "spatial equilibrium model" differs from these in that prices at each shipping point and destination are continuous functions of the quantities shipped or received plus the quantities produced and retained locally. The spatial equilibrium model, with its price-dependent demand and supply functions, may be quite useful in analyzing problems of public policy, most of which arise at the industry level. These include

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[1] See, for example, W. J. Baumol, "Spatial Equilibrium with Supply Points Separated from Markets and with Supplies Predetermined," Report under contract with the U. S. Department of Agriculture, Bureau of Agricultural Economics, Feb. 1952 (hectographed); M. Beckmann, "A Continuous Model of Transportation," *Econometrica*, Oct. 1952, XX, 643-60; S. Enke, "Equilibrium among Spatially Separated Markets: Solution by Electric Analogue," *Econometrica*, Jan. 1951, XIX, 40-47; P. A. Samuelson, "Spatial Price Equilibrium and Linear Programming," *Am. Econ. Rev.*, June 1952, XLII, 283-303.

[2] K. A. Fox, "A Spatial Equilibrium Model of the Livestock-Feed Economy in the United States" *Econometrica*, Oct. 1953, XXI, 547-566.

tariff and other policies affecting international trade, excise taxes, freight-rate regulation, farm price-support policies, and perhaps others. The competitive organization and continuously varying prices in many agricultural commodity markets make these particularly adaptable to analysis by means of the spatial equilibrium model. The existence of a considerable body of empirical demand analyses for farm products is also a favorable factor.

The present paper attempts three things: (1) It expands the empirical model previously mentioned into a more complex one involving two related commodities and applies it to the analysis of changes in freight rates and in various "outside" factors; (2) it appraises the results obtained from this model in relation to those provided by simpler approaches; and (3) it presents some general conclusions as to the applicability of spatial equilibrium models to other commodities and to other types of market structures.

The spatial equilibrium problem for a single commodity has been stated by Enke as follows:

> There are three [or more] regions trading a homogeneous good. Each region constitutes a single and distinct market. The regions of each possible pair of regions are separated—but not isolated—by a transportation cost per physical unit which is independent of volume. There are no legal restrictions to limit the actions of profit-seeking traders in each region. For each region the functions which relate local production and local use to local price are known, and consequently the magnitude of the difference which will be exported or imported at each local price is also known. Given these trade functions and transportation costs, we wish to ascertain: (1) the net price in each region, (2) the quantity of exports or imports for each region, (3) which regions export, import, or do neither, (4) the aggregate trade in the commodity, (5) the volume and direction of trade between each possible pair of regions.[3]

Enke showed that this problem could be solved by "a relatively simple electric circuit."[4] Samuelson treated the same problem on a strictly mathematical basis, and stated that it could be solved "by trial and error or by a systematic procedure of varying shipments" in the direction that ultimately maximizes a certain function. Baumol independently arrived at results similar to Samuelson's. Beckmann formulated the spatial equilibrium problem in terms of continuous distributions of production density and transportation costs.

The first section of this paper extends the Samuelson or Baumol type of approach to an empirical model of the livestock-feed economy in

[3] *Op. cit.*, p. 41.

[4] However, a 10-region model for a single commodity would require 90 rectifiers and numerous batteries and resistors.

the United States. Livestock and feed products account for 60 per cent of total cash receipts from farm marketings, and livestock products account for about an equal percentage of retail expenditures for food. The importance and complexity of the livestock-feed economy are such as to justify the development of rather sophisticated models to appraise government policies and to keep current economic developments under review, as in the outlook and situation reports of the federal Department of Agriculture.

In the earlier article by Fox, the United States was divided into ten regions whose boundaries were defined in rough accordance with differences in the types of livestock and feed production which were given emphasis in them.[5] Each region was a group of states, as the basic data were published by states. The model included a demand function for feed in each of the ten regions and a structure of freight rates or transportation costs between all possible pairs of regions. Livestock numbers and prices in each region were taken as given or predetermined quantities, as was feed production. The analysis was limited to solving for the price and consumption of feed in each region and for the pattern and volume of interregional shipments of feed.

In contrast, the present model treats livestock prices and production in each region as mutually dependent variables. It includes demand and supply functions for livestock products in each region and a set of interregional freight rates for livestock products. The complete solution for any set of values of given variables (including feed production) must yield (1) prices, production and consumption of livestock products in each region and the pattern of interregional shipments of livestock products, and (2) prices and consumption of feed in each region and the pattern of interregional shipments of feed.

I. *Data and Assumptions of the Expanded Model*

The differences between the earlier model and the one presented below can be summarized in the following sets of equations:

A. Previous Model

Demand for feed:

(1.1) $$p_c = f\ (q_c,\ z_h^*,\ p_h^*)$$

Supply of feed:

(1.2) $$z_c^* = k$$

[5] The regional breakdown was adapted from a standard grouping developed in the former Bureau of Agricultural Economics, based on the dominant types of livestock farming carried on in different parts of the country. The adaptation consisted in combining certain of the BAE regions, reducing the total number from twelve to ten. Use of regions rather than states greatly reduced the computational burden; further, as each region was a group of similar states, most of the relevant differences among states were reflected in the differences among BAE regions.

"Gross" equilibrium condition for feed:

(1.3) $$\sum_{1}^{10} q_c = \sum_{1}^{10} z_c^*$$

B. Present (Joint) Model

Demand for feed:

(2.1) $$p_c = f\ (q_c,\ z_h,\ p_h)$$

Supply of feed:

(2.2) $$z_c^* = k$$

Demand for livestock:

(2.3) $$p_h = f\ (q_h,\ n^*,\ y^*)$$

Supply of livestock:

(2.4) $$z_h = f\ (p_h,\ p_c)$$

"Gross" equilibrium condition for feed:

(2.5) $$\sum_{1}^{10} q_c = \sum_{1}^{10} z_c^*$$

"Gross" equilibrium condition for livestock:

(2.6) $$\sum_{1}^{10} q_h = \sum_{1}^{10} z_h$$

In these equations, the variables have the following significance: p_c = price of feed; q_c = consumption of feed; z_h = production of livestock in terms of grain-consuming animal units; p_h = price of livestock; z_c = production of feed; q_h = consumption of livestock; n = human population; and y = disposable personal income per capita.

Variables marked with an asterisk in any equation are "predetermined"—that is, they are assumed to be given numbers. The "gross" equilibrium conditions simply specify that total consumption must equal total production for the United States as a whole. In addition to these, each of the two models includes the more intricate and detailed equilibrium conditions which determine the pattern of interregional trade and regional price differentials. Except for the "gross" equilibrium conditions, the models include an equation of each type (demand and supply for feed and for livestock) for each of the 10 regions. Thus, if the supply "functions" for feed are counted, the present model includes 40 equations in addition to various equilibrium requirements.

Despite the greater complexity of the new joint model, in practice it was not difficult to manipulate it and obtain solutions using ordinary desk calculators. Once an initial joint equilibrium pattern was determined under approximate 1949-50 conditions, it was found possible to obtain equilibrium solutions for other sets of initial conditions (such as a severe drought) within two or three hours—sometimes less if the initial source-and-destination pairings for feed were not disturbed.

Freight rates and basic data. It has been noted above that three variables in the joint model, namely feed production, human population, and disposable income per capita, are taken as given numbers. The values of these variables for each region, at levels appropriate for the 1949-50 feeding year, are shown in Table I. In addition, column 2 of this table contains the numbers of grain-consuming animal units in each region during 1949-50. This variable was used along with the other three in establishing the level and arithmetic slopes of the demand curves for livestock products and feed in each region.[6]

The structure of freight rates for feed is shown in Table II. These freight rates were estimated on the basis of data on freight charges by mileage blocks from the 1950 ICC waybill sample.[7] They are not

[6] Regional data on production of *feed* (actually feed grains and other concentrated feeds) are based on R. D. Jennings, *Feed Consumed by Livestock, 1949-50*; U.S.D.A. Stat. Bull. No. 145, June 1954.

Livestock production in the model is stated in terms of grain-consuming animal units. This series is constructed by weighting numbers of each class of livestock in each state by estimated feed concentrate requirements per animal under normal feeding practices in that state. The weights used are based on feeding practices as of 1941.

The *livestock price* series has no standard published counterpart. The coefficients relating it to other variables are realistic (according to statistical analyses) whether it is regarded as an index of prices of grain-consuming livestock only or of all livestock and livestock products. The level of this series was set in relation to that of the feed price series in rough correspondence with average hog-corn price ratios—between 12:1 and 13:1. The absolute level is arbitrary; its function in the model is that of a price index.

[7] Freight rates are a special problem in the present model because it is implicitly assumed that production and consumption of feed in each region are concentrated at a single point. As these points are mathematical fictions, the determination of appropriate freight charges between regions becomes somewhat arbitrary. One possibility would be to obtain specific railroad freight rates for corn between cities located near the center of feed production in each region. This would be expensive and time consuming, particularly if specific rates were to be calculated over unusual freight paths, as between two strongly deficit regions. The alternative chosen seems adequate for an exploratory study such as this.

It is assumed in Table II that the freight rate between any two regions is the same in both directions. This is frequently not true in practice and is not necessary for a solution of the spatial equilibrium system presented here. Also, it seems necessary for completeness to estimate freight rates between regions which are quite unlikely to have direct dealings with one another in the form of transportation of feed. Since these unusual or improbable paths of interregional shipment rarely figure in the equilibrium solution, the principal requirement is that the assumed freight rates for such paths be reasonably high, even though they may be lower than the specific rates which might be charged if someone wished to make an actual shipment between the regions in question. The distances under-

TABLE I.—BASIC DATA ON FEED SUPPLIES, LIVESTOCK NUMBERS, HUMAN POPULATION, AND DISPOSABLE INCOME BY REGIONS, UNITED STATES, 1949–50

Region	Supply of Feed Concentrates Available 1949–50[a] (Z_e^*)	Grain-Consuming Animal Units Fed, 1949–50 (Z_h)	Human Population April 1, 1950 (n^*)	Disposable Personal Income, 1950	
				Total[b]	Per Capita (y^*)
	(1)	(2)	(3)	(4)	(5)
	1,000 tons	1,000 units	Thousands	Million dollars	Dollars
Northeast	4,336	17,603	43,077	68,750	1,596
Corn Belt	54,697	62,005	27,322	40,721	1,490
Lake	15,393	20,216	12,832	18,141	1,414
Northern Plains	17,279	16,893	4,516	5,824	1,290
Appalachian	8,924	14,184	15,647	14,813	947
Southeast	4,783	8,981	11,410	10,457	916
Delta	2,869	6,364	6,810	5,625	826
Southern Plains	5,852	9,472	11,413	13,196	1,156
Mountain	3,085	3,638	3,654	4,849	1,327
Pacific	3,563	6,766	14,549	23,450	1,612
United States	120,781	166,122	151,228	205,826	1,361

[a] Available for livestock feeding after eliminating nonfeed uses and changes in year-end stocks.

[b] Adapted from published data on income payments to individuals by States by applying the published ratio of disposable income to income payments for the United States as a whole.

actual freight rates between specific points but are based on the following equations:

$$X_{ij} = 5.6 + 0.0168\, M_{ij} \qquad (3.1)$$

$$X_{ij} = 5.6 + 0.0224\, M_{ij} \qquad (3.2)$$

$$X_{ij} = 5.6 + 0.0280\, M_{ij} \qquad (3.3)$$

where X_{ij} represents the freight rate on corn from Region i to Region j, in cents per bushel; and

M_{ij} represents the distance in miles between centers of grain-consuming livestock production in Regions i and j.

Equation (3.1) was used where the ICC data indicated relatively low

lying freight rates estimated from the equations are the shortest highway mileages between certain cities located near the center of livestock production in each region.

Equations (3.1) through (3.3) were chosen after examining the regressions of freight charges upon lengths of haul within and between a number of railroad territories. Moderately different equations could have been chosen without doing violence to the basic data or materially changing solutions obtained from the completed model.

TABLE II.—ESTIMATED FREIGHT RATE PER BUSHEL OF CORN BETWEEN CENTERS OF LIVESTOCK PRODUCTION IN EACH REGION, UNITED STATES, 1950[a]

(in dollars)

Region	North-east	Corn Belt	Lake	Northern Plains	Appa-lachian	South-east	Delta	Southern Plains	Moun-tain	Pacific
Northeast	0	0.2156	0.3125	0.3561[b]	0.2175	0.3464	0.3610[b]	0.4292[b]	0.5357[b]	0.6147[b]
Corn Belt	.2156	0	.1561	.1405	.1575	.2182	.1454	.2136	.3201	.3991
Lake	.3125	.1561	0	.1633	.3136[b]	.3707	.3015[b]	.3697[b]	.3138	.3944
Northern Plains	.3561[b]	.1405	.1633	0	.2980[b]	.3587[b]	.2859[b]	.2638	.2520	.4061
Appalachian	.2175	.1575	.3136[b]	.2980[b]	0	.1554	.2433	.3711[b]	.4776[b]	.5566[b]
Southeast	.3464	.2182	.3707	.3587[b]	.1554	0	.1982	.3539	.5383[b]	.6173[b]
Delta	.3610[b]	.1454	.3015[b]	.2859[b]	.2433	.1982	0	.2190	.4655[b]	.5445[b]
Southern Plains	.4292[b]	.2136	.3697[b]	.2638	.3711[b]	.3539	.2190	0	.3489	.5054
Mountain	.5357[b]	.3201	.3138	.2520	.4776[b]	.5383[b]	.4655[b]	.3489	0	.2976
Pacific	.6147[b]	.3991	.3944	.4061	.5566[b]	.6173[b]	.5445[b]	.5054	.2976	0

[a] Estimated from equations shown in text, not actual freight rates.

[b] Involves shipment by way of the Corn Belt. For example, the freight rate from the Northern Plains to the Northeast is equal to the sum of freight rates (1) from the Northern Plains to the Corn Belt and (2) from the Corn Belt to the Northeast. Shipment over this "indirect" route is cheaper than the "direct" route cost of $0.3618 as estimated from equation (3.2).

freight rates for corn in the railroad territories involved; equation (3.2) was used where an intermediate level of freight rates was indicated; and equation (3.3) was used where the data suggested a relatively high level of freight rates on corn as well as for all paths over which actual shipments of corn were improbable or rare.[8]

The freight rates for livestock (Table III) were similarly derived, using the following equations:

$$(4.1) \qquad X_{ij} = 30 + 0.07\, M_{ij}$$
$$(4.2) \qquad X_{ij} = 30 + 0.08\, M_{ij}$$
$$(4.3) \qquad X_{ij} = 30 + 0.09\, M_{ij}$$

where X_{ij} represents the freight rate on livestock from Region i to Region j in cents per 100 pounds and the M_{ij} are the same as for feed.[9]

Demand and supply functions. For the United States as a whole, the model may be represented by the following equations:[10]

Demand for feed:

$$(5.1) \quad P_c = -0.7497 - 0.022353\, Q_c + 0.016253\, Z_h + 0.1250\, P_h$$

Supply of feed:

$$(5.2) \qquad Z_c^* = 120.78$$

Demand for livestock:

$$(5.3) \qquad P_h = 35.2793 - 0.20226\, Q_h + 0.01111\, Y^*$$

Supply of livestock:

$$(5.4) \qquad Z_h = 166.122 + 3.9700\, (P_h - 8\, P_c - 6)$$

"Gross" equilibrium conditions:

$$(5.5) \qquad Q_c = Z_c^*$$
$$(5.6) \qquad Q_h = Z_h$$

The arithmetic coefficients of the demand functions are adapted from

[8] In several cases, freight rates estimated from equations (3.3) or (3.2) proved to be higher than the sum of freight rates from Region i to the Corn Belt and from the Corn Belt to Region j, as most of the latter rates were estimated from equation (3.1). In these cases, the cost of shipping over the cheaper "indirect" route is taken as *the* freight rate from Region i to Region j.

[9] These rates were based on ICC data for live animals (hogs, cattle, and sheep) partly because data on other types of livestock products were limited and partly because the livestock price series used in the model was set at a level appropriate for live hogs.

[10] Capital letters are used in equations (5.1) through (5.6) to denote totals or averages for the United States as a whole; lower-case letters are used in equations (1.1) through (2.6) to denote values for individual regions. Units of measure for Z_c^*, Z_h, n^*, and y^* are indicated in Table I. P_c represents the price of corn in dollars per bushel (56 pounds) and P_h represents the price of livestock in dollars per 100 pounds, liveweight.

TABLE III.—ESTIMATED FREIGHT RATE PER 100 POUNDS OF LIVESTOCK BETWEEN CENTERS OF LIVESTOCK PRODUCTION IN EACH REGION, UNITED STATES, 1950[a]
(in dollars)

Region	North-east	Corn Belt	Lake	Northern Plains	Appa-lachian	South-east	Delta	Southern Plains	Moun-tain	Pacific
Northeast	0	0.9650	1.2160	1.3920	0.8768	1.2333	1.5204	1.9216[b]	2.1585	2.6944[b]
Corn Belt	.9650	0	.6576	.6521	7228	.8792	.6724	.9566	1.2432	1.7294
Lake	1.2160	.6576	0	.6832	1.1460	1.3116	1.1649	1.3710	1.2208	1.7098
Northern Plains	1.3920	.6521	.6832	0	1 2900	1.3926	1.0623	.9678	.9300	1.5504
Appalachian	.8768	.7228	1.1460	1.2900	0	.6195	.9021	1.3881	1.9002	2.4522[b]
Southeast	1.2333	.8792	1.3116	1.3926	.6195	0	.7572	1.2576	1.9695	2.6086[b]
Delta	1.5204	.6724	1.1649	1.0623	.9021	.7572	0	.8238	1.6257	2.1999
Southern Plains	1.9216[b]	.9566	1.3710	.9678	1.3881	1.2576	.8238	0	1.2414	1.7445
Mountain	2.1585	1.2432	1.2208	.9300	1.9002	1.9695	1.6257	1.2414	0	1.0767
Pacific	2.6944[b]	1.7294	1.7098	1.5504	2.4522[b]	2.6086[b]	2.1999	1.7445	1.0767	0

[a] Estimated from equations shown in text; not actual freight rates.

[b] Involves shipment by way of the Corn Belt. For example, the freight rate from the Southern Plains to the Northeast is equal to the sum of freight rates (1) from the Southern Plains to the Corn Belt and (2) from the Corn Belt to the Northeast. Shipment over this "indirect" route is cheaper than the "direct" route cost of $1 8668 as estimated from equation (4.3).

logarithmic analyses reported in an earlier article.[11] Equation (5.1) implies that the elasticity of demand for feed is −0.5 and that feed consumption tends to increase in direct proportion to livestock production. The coefficient of P_h in this equation assumes that about 8 bushels of feed (corn equivalent) are normally required to produce 100 pounds liveweight of livestock, and that, other things being equal, a given increase in the price of livestock per 100 pounds would be associated with an increase one-eighth as large in the price of feed per bushel. Equation (5.3) implies that the elasticity of demand for livestock is −0.5 and that livestock consumption increases about 0.45 per cent for each 1 per cent increase in disposable income per person. These percentage relations apply precisely only when the price of feed is set at $1.35 per bushel and the price of livestock at $16.80 per 100 pounds.

Equation (5.4) implies an "equilibrium" livestock production of 166.122 million units if the price of livestock per 100 pounds is equal to 8 P_c (the cost of 8 bushels of corn) plus $6.00, which is presumed to cover nonfeed costs of producing livestock. If the price of corn is $1.35 per bushel, the equilibrium price of livestock is $16.80 per 100 pounds. This relationship is about right if we think of "livestock" in terms of hogs, which are by far the largest consumers of feed concentrates. At the equilibrium prices specified, the price of livestock is 12.44 times the price of feed, or very close to the long-term average hog-corn price ratio.

Coefficients of the livestock supply equations were varied regionally on the basis of the relative importance of different classes of livestock and fragmentary information on supply elasticities for each class. The resulting elasticities of livestock supply ranged from 0.50 and 0.45 in the Corn Belt and Northern Plains regions, where the relatively flexible hog- and cattle-feeding enterprises predominate, to 0.25 in the Northeast and Pacific regions where fluid milk and eggs are the principal grain-consuming livestock products. In all other regions an intermediate figure of 0.35 appeared reasonable.[12]

[11] K. A. Fox, "Factors Affecting Farm Income, Farm Prices and Food Consumption," *Agr. Econ. Research*, July 1951, III, 65-82.

[12] Supply elasticities are best defined in relation to the particular time intervals allowed for response. Supply coefficients in the present model allow (perhaps liberally) for the sort of adjustments which might take place within a given feeding year. It would be better for some purposes to use a lagged model such as that developed on the national level by R. J. Foote. ("A Four-equation Model of the Feed-livestock Economy and its Endogenous Mechanisms," *Jour. Farm. Econ.*, Feb. 1953, xxxv, 44-61). In such a model, livestock numbers and prices would be taken as predetermined variables in solving a feed model applicable to the early part of the feed-marketing year, during which the livestock economy would have little opportunity to respond to the new feed harvest. The

Arithmetic demand and supply functions for each of the 10 regions were then specified in such a way as to reflect the price flexibilities and supply elasticities defined above under certain standard conditions ($p_c = \$1.35$, $p_h = \$16.80$, z_h at the levels given in Table I, column 2, and q_h at the United States average level of per capita livestock consumption.) It was necessary to choose arithmetic demand and supply functions, as the various equilibrium conditions are all in arithmetic terms.

The resulting regional demand functions for feed are shown in Table IV, the demand functions for livestock in Table V, and the supply functions for livestock in Table VI.

TABLE IV.—REGIONAL DEMAND FUNCTIONS FOR FEED UNDER APPROXIMATE 1949–50 CONDITIONS
(in million tons)

Region	Constant Term (1)	Change in Feed Consumption per Unit Change in: Feed Price (2)	Livestock Supply (3)	Livestock Price (4)
Northeast	−3.5540	−4.7405	0.7271	0.5925
Corn Belt	−12.5188	−16.6979	.7271	2.0871
Lake	−4.0816	−5.4442	.7271	.6805
Northern Plains	−3.4107	4.5493	.7271	.5686
Appalachian	−2.8637	−3.8198	.7271	.4774
Southeast	−1.8133	−2.4186	.7271	.3023
Delta	−1.2840	−1.7138	.7271	.2142
Southern Plains	−1.9124	−2.5508	.7271	.3188
Mountain	−0.7345	−0.9797	.7271	.1225
Pacific	−1.3661	−1.8221	.7271	.2277
United States	−33.5400	−44.7367	.7271	5.5916

II. *Equilibrium Solutions*

A necessary requirement for competitive equilibrium is that no individual can make a profit by shipping additional quantities of either feed or livestock from one region to another. If one region ships to another, the prices must differ by the amount of the intervening transportation costs. If two surplus regions ship to the same deficit region, the difference between equilibrium prices in the surplus regions will be

early-season prices of feed and livestock would then be taken as predetermined variables in solving for livestock production and prices in the latter part of the marketing year.

Longer-run incidence problems could be handled in a simultaneous model like that of the present paper. However, the regional supply functions would probably be based on long-run profit considerations rather than upon empirical studies of supply response. The present model also disregards speculative and other factors which might affect livestock and feed prices during periods materially shorter than a year.

TABLE V.—REGIONAL DEMAND FUNCTIONS FOR LIVESTOCK UNDER APPROXIMATE 1949–50 CONDITIONS
(in million units)

Region	Constant Term	Change in Livestock Consumption per Unit Change in:	
		Livestock Price	Per Capita Disposable Income
	(1)	(2)	(3)
Northeast	49.6822	−1.4083	0.015646
Corn Belt	31.5134	− .8932	.009924
Lake	14.8002	− .4195	.004661
Northern Plains	5.2087	− .1476	.001640
Appalachian	18.0475	− .5116	.005683
Southeast	13.1600	− .3730	.004144
Delta	7.8545	− .2226	.002474
Southern Plains	13.1634	− .3731	.004145
Mountain	4.2145	− .1195	.001327
Pacific	16.7805	− .4756	.005284
United States	174.4246	−4.9441	.054929

equal to the difference between their freight rates to the deficit region. Thus, an equilibrium solution implies for each commodity a precise structure of regional prices bound together by specific freight rates, except for regions which prove to be self-sufficient under the given conditions.

To solve the feed model represented by equations (1.1) through

TABLE VI.—REGIONAL SUPPLY FUNCTIONS FOR LIVESTOCK UNDER APPROXIMATE 1949–50 CONDITIONS
(in million units)

Region	Constant Term	Change in Livestock Supply per Unit Change in:	
		Feed Price	Livestock Price
	(1)	(2)	(3)
Northeast	16.0316	− 2.0952	0.2610
Corn Belt	50.9326	−14.7632	1.8454
Lake	17.6888	− 3.3696	.4212
Northern Plains	14.1780	− 3.6200	.4525
Appalachian	12.4110	− 2.3640	.2955
Southeast	7.8584	− 1.4968	.1871
Delta	5.5684	− 1.0608	.1326
Southern Plains	8.2882	− 1.5784	.1973
Mountain	3.1832	− .6064	.0758
Pacific	6.1618	− .8056	.1007
United States	142.3020	−31.7600	3.9700

(1.3), we can select by inspection a trading arrangement which looks reasonable, even though it will not necessarily prove to be the equilibrium arrangement. (An "arrangement" simply specifies which regions ship or do not ship to which other regions.) The assumed trading arrangement implies a perfectly definite structure of price differentials in which any one regional price can be taken as the basing point. In practice, the Corn Belt was taken as the basing point and feed prices in other regions were lined up in accordance with their differentials above and below an assumed price in the Corn Belt. Then, using the specified demand functions for feed in each region, the consumption of feed in each of the 10 regions was calculated on the basis of the assumed price in the Corn Belt (in this case $1.40 per bushel). The total feed consumption at this level of prices did not exhaust the available supply—that is, it did not meet the "gross" equilibrium condition. Since the assumed rigid structure of price differentials made total United States feed consumption a linear function of the Corn Belt price, the price adjustment needed to equate United States feed consumption with the available supply could be calculated at once. This adjustment gave the equilibrium price in each region (assuming the specified arrangement) and the equilibrium rate of feed consumption.

A comparison of these regional feed consumption estimates with the given values of feed production yields the net imports or exports of each region. In conjunction with the assumed arrangement, the estimated quantity of feed shipped over each interregional path can be worked out. The arrangement is then tested for the equilibrium requirement that no trader can make a profit by shipping additional feed from one region to another. If this condition is met, the assumed arrangement is also the final one. If not, it is usually very easy (in a 10-region model) to modify the trading arrangement in such a way as to eliminate any remaining profit possibilities.

This approach was adapted to the present joint feed and livestock model as follows: (1) A separate equilibrium arrangement was determined for feed by assuming that the livestock numbers in Table I were given and that livestock prices in all regions were $16.80. The resulting arrangement is shown in Table VII. Then we determined a similar independent arrangement for livestock, assuming livestock numbers fixed. This arrangement is shown in Table VIII. These arrangements imply definite structures of regional price differentials for both feed and livestock.

As a next step, the livestock prices from Table VIII were substituted into the demand equations for feed, yielding a revised equilibrium solution for feed. This revised solution for feed, in conjunction with Table VIII, would represent the joint spatial equilibrium solution we are

TABLE VII — INDEPENDENT EQUILIBRIUM SOLUTION FOR FEED PRICES, CONSUMPTION, AND NET TRADE UNDER APPROXIMATE 1949–50 CONDITIONS[a]

Region	Differential from Corn Belt (1)	Equilibrium Price (2)	Feed Consumption (3)	Feed Production (4)	Net Trade (5)	Origins and Amounts of Net Imports: Corn Belt (6)	Northern Plains (7)	Moun-tain (8)	Total (9)
	Dollars per bushel	Dollars per bushel	Million tons	Million tons	Million tons	Million tons	Million tons	Million tons	Million tons
Northeast	.2156	1.5190	12.00	4.34	−7.66	7.66			7.66
Corn Belt	.0000	1.3034	45.86	54.70	8.84		(2.71)[b]		
Lake	−.0806	1.2228	15.39	15.39	0.00				
Northern Plains	−.1405	1.1629	13.13	17.28	4.15				
Appalachian	.1575	1.4609	9.89	8.93	−0.96	0.96			0.96
Southeast	.2182	1.5216	6.12	4.78	−1.34	1.34			1.34
Delta	.1454	1.4488	4.46	2.87	−1.59	1.59			1.59
Southern Plains	.1233	1.4267	6.69	5.85	−0.84		0.84		0.84
Mountain	−.0320	1.2714	2.72	3.08	0.36				
Pacific	.2656	1.5690	4.52	3.56	−0.96		0.60	0.36	0.96
Total			120.78	120.78	0.00	11.55[c]	4.15	0.36	13.35[d]

[a] Assumes livestock numbers fixed at levels shown in Table I, and livestock prices fixed at $16 80 per 100 pounds in all regions.
[b] Under the assumed structure of freight rates, this amount of feed is shipped to the Corn Belt and reshipped to deficit regions in addition to the 8.84 million tons classified as *net* exports from the Corn Belt.
[c] Includes 2.71 million tons received from Northern Plains and reshipped to other regions.
[d] Excludes 2.71 million tons of imports into the Corn Belt offset by re-exports.

TABLE VIII.—INDEPENDENT EQUILIBRIUM SOLUTION FOR LIVESTOCK PRICES, CONSUMPTION AND NET TRADE UNDER APPROXIMATE 1949–50 CONDITIONS[a]

Region	Differential from Corn Belt (1)	Equilibrium Price (2)	Livestock Consumption (3)	Livestock Production (4)	Net Trade (5)	Origins and Amounts of Net Imports: Corn Belt (6)	Lake (7)	Northern Plains (8)	Delta (9)	Total (10)
	Dollars per 100 lbs.	Dollars per 100 lbs.	Million units	Million units	Million units	Million units	Million units	Million units	Million units	Million units
Northeast	.9650	17.1410	50.51	17.60	−32.91	28.02	4.89			32.91
Corn Belt	.0000	16.1760	31.85	62.00	30.15					
Lake	−.2510	15.9250	14.71	20.22	5.51					
Northern Plains	−.0916	16.0844	4.95	16.89	11.94					
Appalachian	.7228	16.8988	14.78	14.18	−0.60	0.60				0.60
Southeast	.8792	17.0552	10.60	8.98	−1.62	1.53			0.09	1.62
Delta	.1220	16.2980	6.27	6.36	0.09					
Southern Plains	.8762	17.0522	11.59	9.47	−2.12			2.12		2.12
Mountain	.8384	17.0144	3.94	3.64	−0.30			0.30		0.30
Pacific	1.4588	17.6348	16.91	6.77	−10.14		0.62	9.52		10.14
Total			166.12	166.12	0.00	30.15	5.51	11.94	0.09	47.69

[a] Assumes livestock numbers fixed at levels shown in Table I.

Note: Figures may not check in the last decimal place because of rounding.

seeking *if livestock production in each region were predetermined.* But as livestock production is a jointly dependent variable in our model, we proceed to substitute the regional prices for feed and livestock into the regional supply functions for livestock. If the sum of the resulting regional livestock production estimates is not equal to 166.12, we make a "gross" adjustment as follows:

For the nation as a whole (assuming rigid price differentials) we transform equations (5.1), (5.3) and (5.4) respectively into

(6.1) $\Delta Z_h = 61.5271\ \Delta P_c - 7.6909\ \Delta P_h$ (demand for feed)

(6.2) $\Delta Q_h = -4.9441\ \Delta P_h$ (demand for livestock)

(6.3) $\Delta Z_h = -31.7600\ \Delta P_c + 3.9700\ \Delta P_h$ (supply of livestock),

where the Δ's represent changes in the variables from their initial values.[18]

As Z_h in equation (6.1) and Q_h in equation (6.2) were chosen equal in the independent livestock and feed solutions, any *changes* in these two variables to reach a final joint equilibrium must also be equal. This implies the relationship $\Delta P_h = 22.3996\ \Delta P_c$ (obtained by solving equations (6.1) and (6.2) under the condition that ΔZ_h equals ΔQ_h).

Suppose that, on substituting the initial sets of livestock and feed prices into the regional livestock supply functions, we find that the resulting estimate of total United States supply is equal to $Q_h - 2$. We shall call this supply estimate Z_h (3), to denote that it is associated with equation (6.3). Then, to reach equilibrium, Z_h (3) must increase and Q_h must decrease in such a way that ΔZ_h (3) $-\Delta Q_h = 2$. The extent of the change in each variable is easily calculated from the equations shown. The changes in Z_h (3) and Q_h imply that the price of feed in each region must change by a constant amount and that the price of livestock in each region must change by another constant amount. When these changes are made, the system is in "gross" equilibrium. If this step causes a change in the equilibrium trading arrangements for either feed or livestock, some further minor adjustments are needed to complete the joint equilibrium solution.

The joint equilibrium solution under approximate 1949-50 conditions is shown in Table IX. The trading arrangement for feed is simple and logical in most respects. The Corn Belt ships feed to four deficit regions, namely the Northeast, Southeast, Appalachian and Delta. Prices in these regions are equal to the Corn Belt price plus freight. The Lake Region supplies part of the feed requirements of the Northeast and its price is equal to the price in the Northeast region minus freight. The Northern Plains region ships feed to the Pacific and

[18] The transformation consists simply of solving each of the original equations for Z_h or Q_h and passing to first differences. The latter change eliminates all constant terms and those variables whose United States totals are predetermined, specifically Q_c and Y^*.

TABLE IX.—JOINT SPATIAL EQUILIBRIUM FOR FEED AND LIVESTOCK UNDER APPROXIMATE 1949–50 CONDITIONS

A. Feed

Region	Differential from Corn Belt (1)	Equilibrium Price (2)	Feed Consumption (3)	Feed Production (4)	Net Trade (5)	Origins and Amounts of Net Imports: Corn Belt (6)	Lake (7)	Northern Plains (8)	Mountain (9)	Total (10)
	Dollars per bushel	Dollars per bushel	Million tons	Million tons	Million tons	Million tons	Million tons	Million tons	Million tons	Million tons
Northeast	.2156	1.4796	12.22	4.34	−7.88	7.73	0.15			7.88
Corn Belt	.0000	1.2640	45.18	54.70	9.52					
Lake	−.0969	1.1671	15.24	15.39	0.15			(2.13)[a]		
Northern Plains	−.1405	1.1235	13.23	17.28	4.05					
Appalachian	.1575	1.4215	9.96	8.92	−1.04	1.04				1.04
Southeast	.2182	1.4822	6.17	4 78	−1.39	1.39				1.39
Delta	.1454	1.4094	4.36	2 87	−1.49	1.49				1.49
Southern Plains	.1233	1.3873	6.85	5.85	−1.00			1.00		1.00
Mountain	−.0320	1 2320	2.84	3.09	0.25					
Pacific	.2656	1.5296	4.73	3 56	−1.17			0.92	0.25	1.17
Total			120.78	120 78	0.00	11.65[b]	0.15	4.05	0.25	13.97[c]

B. Livestock

Region	Differential from Corn Belt (11)	Equilibrium Price (12)	Livestock Consumption (13)	Livestock Production (14)	Net Trade (15)	Origins and Amounts of Net Imports: Corn Belt (16)	Lake (17)	Northern Plains (18)	Total (19)
	Dollars per 100 pounds	Dollars per 100 pounds	Million units	Million units	Million units	Million units	Million units	Million units	Million units
Northeast	.9650	17.1045	50.56	17.41	−33.15	27.63	5.52		33.15
Corn Belt	.0000	16.1395	31.88	62.06	30.18				
Lake	−.2510	15.8885	14.73	20.45	5.72				
Northern Plains	−.0916	16.0479	4.96	17.37	12.41				
Appalachian	.7228	16.8623	14.80	14.03	− 0.77	0.77			0.77
Southeast	.8792	17.0187	10.61	8.83	− 1.78	1.78			1.78
Delta	.2900	16.4295	6.25	6.25	0.00				
Southern Plains	.8762	17.0157	11.61	9.46	− 2.15			2.15	2.15
Mountain	.8384	16.9779	3.95	3.72	− 0.23			0.23	0.23
Pacific	1.4588	17.5983	16.93	6.70	−10.23		0.20	10.03	10.23
			166.28	166.28	0.00	30.18	5.72	12.41	48.31

[a] Under the assumed structure of freight rates, this amount of feed is shipped to the Corn Belt and reshipped to deficit regions in addition to the 9.52 million tons classified as *net* exports from the Corn Belt.

[b] Includes 2.13 million tons received from Northern Plains and reshipped to other regions.

[c] Excludes 2.13 million tons of imports into the Corn Belt offset by re-export.

Southern Plains regions, with the Mountain region serving as an auxiliary source of supply for the Pacific. The only additional item needed is a link connecting these two systems. In this case it turns out that the Corn Belt in equilibrium would import some feed from the Northern Plains and re-export an equivalent amount to other regions. Hence, the link is provided by the fact that the price in the Corn Belt is equal to that in the Northern Plains plus freight. The total net interregional trade, exclusive of re-exports, is 13.97 million tons, or about 12 per cent of the total feed concentrate supply.

The three major surplus regions with respect to feed also prove to be surplus with respect to livestock. The Northeast is by far the largest importer of grain-consuming livestock and the Pacific region ranks second. In equilibrium, the Corn Belt ships livestock to the Northeast, Appalachian, and Southeast regions. Prices in these regions are equal to the Corn Belt price plus freight. The Lake Region supplies the remaining requirements of the Northeast, but it also ships a small part of its export supplies to the Pacific region. Hence, the price of livestock in the Lake region is equal to the Northeast price minus freight, and the Pacific price is in turn equal to the Lake price plus freight. The Pacific region gets the great bulk of its livestock imports from the Northern Plains, so that the price in the latter region is equal to the Pacific price minus freight. In addition, the Northern Plains supplies the import requirements of the Southern Plains and Mountain regions so that their prices are equal to the Northern Plains plus freight. The Delta region proves in this model to be self-sufficient with respect to livestock

Total net interregional shipments of livestock products are estimated as equivalent to 48.31 million grain-consuming animal units, or about 29 per cent of the total production of grain-consuming livestock and products.

Table X compares the net trade estimates obtained from the joint equilibrium model with estimates based on simpler "common sense" assumptions. Columns (1) and (2) compare the quantity of feed produced in each region with the quantity needed to feed its actual 1949-50 livestock numbers at the U.S. average rate. The feed surpluses and deficits implied by this comparison are shown in column (3) and the net imports and exports resulting from the joint equilibrium model are shown in column (4). The correspondence is obviously close.

Column (6) shows the regional distribution of livestock consumption if per capita rates in each region were the same as for the United States as a whole. Column (7) redistributes these regional livestock consumption estimates by adjusting them for regional differences in per capita disposable income. It is assumed, based on both time-series and family-

budget analyses, that a departure of 10 per cent from the national average in per capita disposable income will be associated with a departure of 4 per cent in per capita consumption of livestock products. Columns (8) and (9) show a close correspondence between the livestock net trade estimates obtained in this fashion and those obtained from the joint equilibrium model.

These comparisons do not prove that the model accurately portrays the interregional trade pattern of the real world (much of which is unknown due to inadequate data), but they at least suggest that the model and the manipulations applied to it involve no serious mechanical or arithmetical imperfections.

Equilibrium solutions were also calculated on the basis of various changes in the initial data. The results of two of these solutions will serve to illustrate the flexibility and usefulness of the model.

A. *Effects of a severe drought.* In one variation, feed supplies were assumed to decline about 30 per cent in the Corn Belt and 75 per cent in the Northern Plains. These drops were closely comparable with the actual changes from 1935 to 1936. Feed supplies in other regions were assumed to be unchanged.

In the equilibrium solution, the original trading arrangement for feed was drastically altered. The Southeast region became self-sufficient, neither importing nor exporting feed. The Northern Plains became a major feed-deficit area, drawing supplies from the Lake, Corn Belt, and Mountain regions. The Appalachian region shifted to a surplus status, shipping to the Northeast. The Southern Plains also moved to a surplus position, shipping a small quantity of feed to the Delta region. Feed prices in the Northern Plains rose 28 cents a bushel relative to prices in the Corn Belt; altogether, 7 of the 9 regional price differentials from the Corn Belt were changed by the drought situation. Net interregional trade in feed dropped more than 25 per cent.

The original trading arrangement for livestock was not changed by the assumed drought, although two regions narrowly missed shifting from a déficit to a self-sufficient status. The drought situation found the Appalachian and Mountain regions importing less than 1 per cent of their livestock requirements, compared with 5 or 6 per cent in the 1949-50 solution. The Delta region remained self-sufficient in the drought situation. but its livestock price declined relative to that in the Corn Belt. All other livestock price differentials remained as in the 1949-50 solution. Net interregional trade in livestock declined about 12 per cent, less than half as much as did interregional shipments of feed.

This type of solution should be helpful in appraising the incidence of future droughts upon livestock producers in different regions and in

TABLE X.—JOINT EQUILIBRIUM ESTIMATES OF NET TRADE IN LIVESTOCK AND FEED COMPARED WITH ESTIMATES BASED ON SIMPLER ASSUMPTIONS

Region	Feed				Livestock				
			Net trade			Consumption		Net Trade	
	Production (1)	"Average' Consumption[a] (2)	"Expected" (1)–(2) (3)	Equilibrium (4)	Production (5)	"Average"[b] (6)	"Average" adj. for Income Levels[c] (7)	"Expected" (5)–(7) (8)	Equilibrium (9)
	Million tons	Million tons	Million tons	Million tons	Million units	Million units	Million units	Million units	Million units
Northeast	4.34	12.80	−8.46	−7.88	17.41	47.35	50.63	−33.22	−33.15
Corn Belt	54.70	45.05	9.65	9.52	62.06	30.05	31.18	30.88	30.18
Lake	15.39	14.74	0.65	0.15	20.45	14.10	14.31	6.14	5.72
Northern Plains	17.28	12.32	4.96	4.05	17.37	4.97	4.87	12.50	12.41
Appalachian	8.92	10.27	−1.35	−1.04	14.03	17.21	15.11	− 1.08	− 0.77
Southeast	4.78	6.52	−1.74	−1.39	8.83	12.53	10.89	− 2.06	− 1.78
Delta	2.87	4.59	−1.72	−1.49	6.25	7.48	6.31	− 0.06	0.00
Southern Plains	5.85	6.88	−1.03	−1.00	9.46	12.56	11.81	− 2.35	− 2.15
Mountain	3.09	2.66	.43	0.25	3.72	4.03	3.99	− 0.27	− 0.23
Pacific	3.56	4.95	−1.39	−1.17	6.70	16.00	17.18	−10.48	−10.23
Total	120.78	120.78	0.00	0.00	166.28	166.28	166.28	0.00	0.00

[a] Assumes the U. S. average rate of feed consumption per animal unit in each region.
[b] Assumes the U. S. average rate of per capita consumption in each region.
[c] Assumes that a departure of 10 per cent from the national average level of disposable income is associated with a departure of 4 percent from the national average consumption of livestock products.

evaluating the benefits of feed grain storage programs. A related application involves estimating the pattern of feed prices and shipments likely to emerge at harvest time on the basis of advance forecasts of feed production in each region.[14]

B. *Effect of an increase in freight rates for feed.* An assumed increase of 50 per cent in all freight rates for feed changes the 1949-50 trading arrangement in only one respect—the Lake region shifts from a surplus to a self-sufficient status with respect to feed. However, substantial changes occur in feed price differentials and in the volume of interregional feed shipments.

The effects of the freight rate increase can be shown more clearly if we first assume that livestock numbers and prices in each region are held constant at their 1949-50 joint equilibrium levels. It is obvious that the change in freight rates will increase the feed price spreads between surplus and deficit regions. For example, feed prices in the Pacific region are increased about 11 cents a bushel and those in the Northern Plains are reduced about 9 cents a bushel. These price changes also have consequences for consumption and interregional trade. The Pacific region will consume less feed at the new higher price, and the Northern Plains will retain more feed at the new lower price. Thus, imports into each deficit region and exports from each surplus region are reduced by varying amounts. The over-all reduction in interregional trade in feed is about 8 per cent under the present assumptions.

When livestock prices and production are permitted to vary, however, further consequences become evident. Livestock production decreases slightly in the feed deficit regions and expands a little in the feed surplus regions. The regional adjustments in livestock production are such as to reduce interregional shipments of feed another 7 per cent. The final effect of the assumed increase in freight rates for feed is (in the present model) to reduce interregional feed shipments by nearly 15 per cent from the 1949-50 joint equilibrium level. Thus, the increase in freight revenues from feed is only 25 or 30 per cent rather than the 50 per cent which might have been anticipated in the absence of demand and supply adjustments.

III. *Applicability of Spatial Equilibrium Models to Other Commodities and Types of Market Structures*

Spatial equilibrium models have considerable appeal in that they include all of the elements—demand functions, supply functions, and transport costs—which are theoretically required for solving inter-

[14] Such forecasts or "early season indications" are published by the Department of Agriculture at monthly intervals during the growing season. A forecasting application of the independent feed model was presented in the earlier paper by Fox. (See footnote 2.)

regional pricing and trade problems at the industry level. It is our impression that many freight-rate problems are conceived in terms of rates to a given destination from two or three competing sources, and that indirect effects on the rest of the economy are disregarded. These effects may indeed be small in most cases, but they can only be checked by constructing a model which explicitly provides for their measurement. Similarly, we suspect that in estimating regional deficits or surpluses few marketing firms take explicit account of the slopes of regional demand curves.

For example, an assumption of equal per capita consumption in all regions would be appropriate (1) if transport costs were zero and (2) if all demand and supply functions were completely inelastic.[15] Hence, the gain in knowledge resulting from a more complete model increases with the importance of transportation costs (relative to commodity price) and with increasing elasticities of supply and demand.

The stability of trading patterns and price differentials for a given commodity from year to year depends on the above factors and also upon the degree of regional specialization—that is, upon the size of the net trade of each region relative to its total production or consumption of the commodity. It may be perfectly obvious that some regions will retain their surplus positions under almost any conceivable circumstances. But a region which imports less than 5 per cent of its requirements in normal years may well shift to a self-sufficient or even a surplus position on occasion, involving sharp price changes relative to other regions.

Spatial equilibrium models should be useful in understanding the price and trade pattern of any farm product or industrial raw material which is characterized by competitive markets and continuously varying prices. They are obviously applicable to international as well as to interregional market structures.[16] They can be extended to groups of three or more related products; the relationships may be either competitive or complementary in demand, supply, or both. (The livestock-feed model illustrates a derived demand or raw material and finished product relationship).

Some of the short cuts used in the livestock-feed model depended upon the assumed linearity of the demand and supply functions. How-

[15] Strictly speaking, the assumption that per capita income and other relevant variables are the same in all regions is also implicit.

[16] Some applications to international trade problems are given in K. A. Fox, "The Use of Economic Models in Appraising International Trade Policies," *Jour. Farm Econ.*, Dec 1954, XXXVI, 944-58. Effects of changes in tariffs, subsidies, import quotas and price-support programs are illustrated in terms of a model similar to that of Table VII.

ever, curvilinear functions should not greatly increase the difficulty of solution.[17]

The applicability of spatial equilibrium models to products with administered prices is less obvious. However, the aggregate demand curve for such a product in each region can be regarded as a continuous function. The marginal cost curve of each plant (or the industry marginal cost curve if there were several plants operating in a given region) could be either a continuous function or a series of steps. If there were only a few plants producing a given commodity, each plant might be treated as a surplus "region" with zero consumption and each consuming center might be treated as a deficit region with zero production. The maximization criterion could be varied according to the competitive structure of the industry. For example, if one firm held a nationwide monopoly but operated plants in several locations, it would be possible to calculate a price, output and shipment pattern which would maximize monopoly profit.[18] On the other hand, if each plant were owned by a different firm, a solution could be obtained under which each firm maximized its returns by equating marginal net revenue (f.o.b. plant) from all markets to which it could ship profitably. Appropriate maximization criteria could also be applied to an industry in which each of two or more firms operated plants at a number of locations.[19]

Thus, the chief limitation of the spatial equilibrium model with respect to administered-price commodities is that it does not accurately express the mechanism by which actual prices are determined. Nevertheless, given the necessary information about demand and cost curves, the spatial equilibrium model indicates an optimum price and trade pattern which could be a useful guide in setting administered prices. It can also indicate the pressures on an existing market pattern which would result from the construction of new plants at specified locations.

Conceptually, the spatial equilibrium model is one of very wide applicability. It is not excessively difficult to manipulate. The most serious

[17] Theoretically, some types of curves might lead to multiple solutions. But this is not likely to happen with functions of realistic shape, such as monotonically decreasing demand curves and horizontal, vertical, or monotonically increasing supply curves.

[18] This is not to suggest that firms do, should, or can maximize monopoly profit without regard to other considerations. Conceptually, any limitations on the pursuit of profit which were set by public authorities or by company policy could be incorporated into the model. The model could also be used to estimate the pattern which would result if the various units of such a firm were operated competitively.

[19] Maximization could be carried out subject to various policy constraints relating to price leadership, market shares, and so forth. Here again the spatial equilibrium model is both neutral and flexible.

limitation upon its use is independent of the model as such, namely the difficulty of determining the individual demand and supply or cost functions. Statistical demand functions for many farm and food products have been determined with considerable reliability, and there is no conceptual barrier to their derivation for industrial products. In determining prices, large firms must now consider on a judgment basis information which is logically related, or even equivalent, to market demand functions. It seems reasonable to believe that the decisions of such a firm could be improved if these intuitive judgments about demand in various markets were formalized into demand functions and these in turn combined into a model of the entire market structure in which it was interested.

The success of operations-research groups in applying the "transportation" and "contract award" models to practical problems suggests that experiments with the spatial equilibrium model might be both instructive and profitable. The other two models deal only with limited aspects of a firm's activities or even with individual procurement operations. The spatial equilibrium model, on the other hand, can encompass broad economic characteristics of an industry which condition the success of major policy decisions by the firms within it or by public bodies whose regulatory activities impinge upon it.

SOVIET PRICE REDUCTIONS FOR CONSUMER GOODS, 1948-1954

By COLIN D. CAMPBELL AND ROSEMARY G. CAMPBELL*

The earliest reference to Soviet price reductions is a statement by Stalin in 1946 that "special attention will be devoted to expanding the production of consumers' goods, [and] to improving the living standards of the workers through consistent price reductions on all commodities."[1] Although the Soviet government raised prices of many consumer goods in 1946, and the fourth five-year plan directive, which was published a month after Stalin's statement, did not mention price reductions, the Soviet government has lowered the prices of a large number of consumer goods each spring from 1948 to 1954. The fifth five-year plan directive in 1952 prescribed that:

> Retail prices of consumers' goods should continue to be reduced steadily, bearing in mind that lowering the prices is the chief means of systematically raising the real wages of the workers and employees and increasing the incomes of the peasants.[2]

For the first time since 1948, price reductions were not announced in March or April 1955. This may represent a change in price policy; however, it could also be due to the fact that the 1951-55 goal for price reductions was reached during the first four years of the fifth five-year plan.

The decline in prices during the past seven years is strikingly different from the trend of prices in the USSR prior to the second world war. Many Western economists have believed that planned economies would be bothered by rising prices. Hoover writes:

> While the prevention or cure of unemployment and depression is quite simple in a Soviet type of economy, the danger of inflation is always more real. This flows out of the circumstance that, from the standpoint of national planning, global underemployment of resources is likely

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[1] V. Moskvin, "Retail Price Reductions and Soviet Trade," *Curr. Dig. Sov. Press*, Apr. 14, 1951, III, 30.

[2] "Party Draft Directives on Fifth Five-Year Plan," *Curr. Dig. Sov. Press*, Sept. 13, 1952, IV, 8.

> to exist only if there is an underestimate of the potential volume of production. Planners can always think of useful and even grandiose ways in which to allocate limited national resources. Since people in general want their wages and salaries increased, as well as their leisure, while they are always anxious to have prices of goods and services lowered, as well as anxious that the deductions by the economic system in the form of taxes for all purposes should be as low as possible, it is usually more likely that economic planners will err in the direction of disbursing more income than the planned utilization of the national resources will warrant.[3]

Gerschenkron also has stated that the postwar deflation in the Soviet Union may not last. He writes:

> As was the case in the thirties, the Soviet government, faced with the necessity of maintaining labor incentives and unable to provide real increases in the population's purchasing power because of the high rate of nonconsumption, may be driven once more to provide the *semblance* of such increases in the form of inconvertible increases in money wages. It is just possible that the current year 1952 will form the dividing line between the years of past deflation and those of coming inflation.[4]

This paper gathers together information about the price reductions from translated articles appearing in *The Current Digest of the Soviet Press*. The articles in the Soviet press are interesting not only because they help to explain the price reductions, but also because they throw some light on the nature of the Soviet pricing system for consumer goods.

I. *The Factors Making Price Reductions Possible*

Soviet leaders claim that they have been able to reduce prices because of large increases in output and lower costs. The 1950 price reduction decree states:

> In connection with new successes in industrial and agricultural production during 1949 and with increased labor productivity and reduced production costs, the Soviet government and the Communist Party Central Committee deem it possible to carry out, as of March 1, 1950, a new, third, reduction of state retail prices on foodstuffs and manufactured consumers' goods.[5]

However, the annual price reductions cannot be explained solely by the

[3] C. B. Hoover, "Soviet Economic Policies at Home and Abroad," *Proceedings, Acad. Pol. Sci.*, Jan. 1947, XXII, 115.

[4] A. Gerschenkron, "Comments on 'National Income' by Gregory Grossman," A. Bergson, ed., *Soviet Economic Growth* (Evanston, 1953), p. 30.

[5] "Price Cuts and the Gold Standard," *Curr. Dig. Sov. Press*, Apr. 15, 1950, II, 16.

rapid increase in the output of consumer goods. They have been possible in part because the government has at the same time stabilized money wages. Since the second world war, the government has not resumed its prewar policy of continuously raising money wages, and it has strictly controlled payroll allocations to industries. The expansion in total money income due to growth in the size and skill of the labor force has been small compared to the increase in the output of goods. The 1954 price reductions perhaps show that large annual price cuts depend on the successful stabilization of money incomes. That the 1954 reductions were the smallest of those that have been granted is probably due to the fact that in 1953 money incomes were raised by cutting in half the contributions to the state loan, reducing the agricultural tax, and raising procurement prices for agricultural produce.

Soviet monetary policy has probably been consistent with their deflationary price policy, although no direct information is available on the money supply during the past seven years.[6] Because of the dual marketing system, a successful policy of price reductions in the state stores would probably be impossible under inflationary monetary conditions. Although the bulk of retail sales are made by state and cooperative stores where prices are set or directly influenced by government decree, there are also some free markets where fresh foods—fruits, vegetables, meats, and dairy products—are sold at uncontrolled prices.[7] If the quantity of money had been rapidly expanding, the gap between the fixed state prices and the uncontrolled prices would have grown larger, shortages in the state stores would have become acute, and the illicit resale of state merchandise would have been extremely difficult to control.

The Soviet monetary reform in December 1947 contributed to the postwar deflation by preventing a rise in the rate of spending when rationing was removed. Prior to the reform the real purchasing power of the large cash holdings of the populace was not large because uncontrolled prices were very high and ration points were needed in addition to cash to purchase the lower priced goods in state stores. When rationing was removed and uncontrolled prices fell, the real value of the cash holdings of the populace would have risen sharply if the government had not reduced money balances.

[6] Budget surpluses have been large since the second world war. There were small budget surpluses during the 1930's, but there was a large increase in the money supply probably because of an expansion of bank credit. See F. D. Holzman, "The Soviet Budget, 1928-1952," *Nat. Tax Jour*, Sept. 1953, VI, 247, and A. Baykov, *The Development of the Soviet Economic System* (New York, 1948), p. 421.

[7] Janet Chapman has estimated that in 1948 the free markets handled approximately 15 per cent of total retail trade. See "Real Wages in the Soviet Union, 1928-1952," *Rev. Econ. Stat.*, May 1954, XXXVI, 135.

Soviet writers also state that the government has temporarily sacrificed budget revenues in order to reduce prices. If prices had not been cut, either turnover tax receipts or profits would have been larger.[8] The 1949 price reduction decree states:

> This first stage resulted in making goods sold in state retail trade cheaper by at least 57 billion rubles in the course of a year. This sum represents a pure loss to the state budget. The loss had to be covered, and was actually covered subsequently by the government, thanks to a growth in labor productivity, a rise in production of consumers' goods, and a reduction in production costs. It was, however, at the same time, a pure gain for the population.[9]

The relation of the annual price reductions to the budget was further taken into account in the 1953 and 1954 budget announcements. The Minister of Finance resorted to an extremely unusual accounting practice by including certain revenues and expenditures that might have been incurred if there had been no price reductions. An amount slightly smaller than the annual savings to the population from lower prices in the state stores was added to both revenues and expenditures.[10] The inclusion of these items in the budget announcements probably has little significance except as an attempt by the Soviet government to convince the populace that it is deeply interested in their welfare.

II. *Uses of the Price Reductions*

The annual price reductions have been fully exploited for propaganda purposes. One example of this is the Soviet claim that the decline in prices in the USSR shows the superiority of socialism over capitalism. The Soviet deflation from 1948 to 1954 contrasts sharply with the trend of prices during this period in many other countries. Even though inflation reveals nothing definite about real economic developments in capitalist countries, Soviet writers state that it reflects the increasing misery of the proletariat. They write:

> Whereas the Soviet Union is consistently following a policy of reducing prices and improving the material and cultural standards of the workers, in the capitalist countries the imperialists, embarking upon a wild arms race, are shifting the burden of ever-increasing military expenditure to the shoulders of the working people.

[8] For a discussion of whether price reductions ever result from the lowering of turnover taxes, see J. Robinson, "Theory and Practice of Planning," *Sov. Stud.*, July 1952, IV, 57, and M. Dobb, "A Note on Turnover Tax and Prices," *Sov. Stud.*, Jan. 1953, IV, 273-74.

[9] "Price Cuts," *Curr. Dig. Sov. Press*, Mar. 29, 1949, I, 43.

[10] For a discussion of this unusual change in the Soviet budget announcements, see A Nove, "Soviet Budgets after Stalin," *Rev. Econ. Stat.*, Nov. 1954, XXXVI, 423.

Retail prices constantly rise in the capitalist world, public consumption is curtailed, and the impoverishment of the workers becomes catastrophically intensified.[11]

The Soviet government has used both percentage reductions in consumer prices and estimates in rubles of the annual savings to the population to show how the scale of living has risen. In the prewar period the Soviet leaders published data on increases in money wages for this purpose, but they did not give a cost-of-living or price index that would be needed to translate the money wage figures into real terms.

In 1954 the Minister of Finance announced that prices of consumer goods and foodstuffs were approximately 57 per cent below their level in 1947, the year before the first annual price cut.[12] The government has also estimated that the total reduction in prices for the four years from 1950 to 1954 was more than 25 per cent and was in four years slightly higher than the five-year goal of 23.5 per cent.[13] The return to prewar levels of production since the second world war has resulted in unusually large annual increases in the supply of consumer goods.[14] Because money wages have been relatively stable and shortages have probably not been made substantially larger by the price cuts, the percentage reductions in prices measure roughly the rise in real wages—particularly for urban workers who are significantly affected by prices in the trade network. It is interesting that Janet Chapman has estimated that from 1948 to 1952 real wages increased between 58 and 66 per cent, which is similar to the percentage reduction in prices announced in the Soviet press.[15]

The estimated annual savings to the population shown in Table I are usually announced at the same time the price cut decree is issued. These annual gains are believed to be the difference in the estimated annual retail sales at the old and the new prices. In 1948 the gain was based on the lowering of prices accompanying the monetary conversion in December 1947, the 1949 gain on the first two annual price reductions which were made in April 1948 and March 1949, and the gains for 1950 to 1954 on the price reductions announced in the spring of those years.

[11] "New Reduction of Retail Prices," *Curr. Dig. Sov. Press*, Apr. 14, 1951, III, 29, and Moskvin, *op. cit*, p. 30.

[12] "Zverev's Report on the 1954 Budget," *Curr. Dig. Sov. Press*, June 16, 1954, VI, 19.

[13] "Speech by Deputy A. I. Mikoyan," *Curr. Dig. Sov. Press*, July 21, 1954, VI, 13.

[14] For estimates of the large increases in the output per capita of many basic consumer goods from 1948 to 1952, see Chapman, *op. cit.*, p. 148

[15] *Ibid.*, p. 146. The variations in Janet Chapman's figures are dependent on (1) whether real wages are examined before or after taxes and bond purchases, and (2) whether 1928 or 1937 cost-of-living indexes are used.

TABLE I.—SAVINGS TO THE POPULATION FROM ANNUAL PRICE REDUCTIONS, 1948–1954*
(billions of rubles)

Year	In State Retail Trade	In Collective Farm Markets and Cooperative Trade	In State Retail Trade and Cooperative Trade[a]	In Collective Farm Markets	Total
1948	57	29			86
1949	48	23			71
1950	80	30			110
1951			27.5	7	34.5
1952			23	5	28
1953			46	7	53
1954			20	—[b]	20[c]

[a] Since 1951 the gains from trade in cooperative stores have been included with those from state retail trade rather than with those from the collective farm markets. The reason for this change is not known, but since cooperatives have had some degree of independence in setting prices, they have probably not fitted into either group perfectly. On the mechanism for determining prices charged by both consumer and industrial cooperatives, see N. Jasny, *The Soviet Price System* (Stanford, 1951), pp. 63–64

[b] No amount specified.

[c] In August 1954, the prices of many fresh foods were raised. To offset the loss to the population from these price increases, prices of several foodstuffs were reduced starting in October 1954. It is not known what effect these midyear changes in prices would have on the total gains originally predicted for 1954 See "Decree on Seasonal Prices for Vegetables and Fruit," *Curr. Dig. Sov. Press*, Sept. 29, 1954, VI, 3–4.

* Sources: "Price Cuts," *Curr. Dig. Sov. Press*, Mar. 29, 1949, I, 43–44, "Price Cuts and the Gold Standard," *Curr. Dig Sov. Press*, Apr 15, 1950, II, 16; "New Reduction of Retail Prices," *Curr. Dig. Sov. Press*, Apr. 14, 1951, III, 29, "Zverev's Report on the 1954 Budget," *Curr. Dig Sov. Press*, June 16, 1954, VI, 19, "Retail Price Cut Decree is Issued," *Curr. Dig Sov. Press*, Apr 25, 1953, V, 5

The magnitude of successive price reductions in state and cooperative stores is large when compared with recent annual goals for state and cooperative trade. Total gains for 1951 to 1954, inclusive, amount to 116.5 billion rubles, which is 42 per cent of the 1950 planned goal of 275 billion rubles for state and cooperative trade.

Except in 1954 lower food prices in the collective farm markets have been listed as one of the results of the decrees.[16] In 1954 very small gains from lower prices in the collective farm markets were expected because reductions in food prices in state stores were extremely small during that year. Even though the government does not directly control collective farm prices, Soviet leaders have stated that price reductions in state retail outlets will "cause an identical drop in prices on the collective farm and cooperative market."[17] Collective farm prices have

[16] This presumption has caused Baykov to question the claimed gains to the population from price reductions. See A. Baykov, "Internal Trade During the War and Its Post-War Development," *Bull. Sov. Econ Develop.*, Sept. 1950, Bull. 4, 8.

[17] "Price Cuts," *op cit.*, p. 43.

probably fallen since the second world war because of the rapid recovery in the output of farm products. However, because state prices are already much lower than collective farm prices and shortages prevail in state stores, the relationship between state and free prices is probably the opposite of that which the government claims. Under such conditions state price cuts would tend to cause collective farm prices to rise. Lower prices in state retail outlets would tend to increase the amount of purchasing power that is left over to be spent in the free markets. Also, because some persons will want to increase their purchases when state prices are lowered, more buyers will be shifted to the free markets.

The price reduction decrees are also part of the continuous drive to stimulate the populace to greater effort. The Minister of Trade recently stated:

> No proof is needed of the fact that our state's efforts to improve the material status of the working class and the collective farm peasantry are being repaid one hundredfold to the socialist society. Labor productivity is increasing, cost of production is dropping, and the quantity of goods produced is growing and their quality is improving.
>
> Only in a socialist country does the working class realize and actually perceive that the higher labor productivity and the lower production costs, the more commodities there are for the working class, the lower prices are and the better the working class lives.[18]

After the price reductions, unions are directed to "explain exhaustively the importance of the new decrees to workers" and to "develop extensive socialist competition for fulfillment and overfulfillment of state plans by all enterprises . . . . for increased labor productivity and high-grade production techniques."[19] At this time industrial plants customarily make pledges to fulfill or overfulfill their plans.

III. *Price Cuts for Individual Items*

It is not clear what determines which items will be cut in price and what the magnitude of the individual price cuts will be. Joan Robinson believes that the annual price cuts are simply a means of increasing the general purchasing power of the population so that they will be able to buy the increased output of consumer goods. She has stated that when Soviet planners change prices they do not attempt to reach equilibrium through price adjustments for individual items. She writes:

> In general it is considered wrong in principle to use price as a means

[18] "Speech by Dep. A. I. Mikoyan," *op. cit.*, p. 13.

[19] "On Tasks of Trade Unions in Connection with Announcement of Price Reductions," *Curr. Dig. Sov. Press*, Apr. 14, 1951, III, 31.

of cutting demand to equality with supply in particular commodities. . . .

The overall cut in prices is intended to reflect the overall fall in cost of a range of commodities rather than that of each item taken separately.[20]

It is not known how Mrs. Robinson would explain the variations in price cuts among the items listed in Table II. These variations could reflect changes in the market conditions of different commodities. Price reductions for agricultural commodities have been relatively large, perhaps because of a change in the terms of trade between agricultural products and manufactured consumer goods.

Dobb says that conditions of supply are taken into consideration in making price changes. He writes:

It is hard to believe that the differences of price-cut have not been influenced, at least in part, by current differences in the supply position (price-cuts tending to be smaller in the case of things which were still in short supply).[21]

A recent Soviet article supports Dobb's point of view:

The price of individual products . . . deviates from the value. The practice of price-fixing involves the most diverse ratios of retail prices and unit costs.

It is perfectly clear that in determining prices the demand for various commodities cannot be disregarded. The Soviet state is doing everything necessary to fully satisfy the requirements of the population. But in the case of some items price must be used as an instrument to regulate consumption of these items until production reaches a point required for maximum satisfaction of the demand.

Fixing prices of goods without relation to the demand for them leads to a decreased rate of turnover of the goods. In some instances the setting of low prices fosters speculation in goods.[22]

Mrs. Robinson is correct in stressing the insensitivity of Soviet prices to changes in conditions of demand and supply over short periods. Table II shows that prices of many consumer goods have not been changed as often as once a year. Some items have been cut only once in seven years. In one of his essays on socialist calculation, Hayek pointed out that when prices of consumer goods are fixed by the government, the problem of how often prices should be revised presents a dilemma: if prices are changed frequently, the administrative costs of

[20] Robinson, *op. cit.*, p 57.

[21] Dobb, *op. cit*, p 274.

[22] D. Krondrashev, "Price Fixing and Problems of Economic Planning," *Curr. Dig. Sov. Press*, June 6, 1953, V, 11.

changing prices will be high, but if prices are changed infrequently, the demand for many items will often be unequal to the supply.[23] Soviet planners have apparently chosen to avoid the high administrative costs of changing prices frequently and to accept conditions of market disequilibrium.

Prices of individual items have been set so low in most cases that the demand for them exceeds their supply, even though the output of consumer goods has been increasing rapidly and official rationing was given up in 1947. Although Lange thought that in a socialist system equilibrium prices that would avoid shortages and surpluses could be found by a process of trial and error, such a pricing system is not found in the USSR.[24] The Soviet press often mentions that items sell out rapidly when placed on sale in state stores. The following examples are typical:

> The board of the Central Union of Consumer Cooperatives is still permitting intolerable disruption of the supply of certain goods to the collective farm countryside. In many districts there are still total stoppages in the sale of such everyday articles as salt, kerosene, soap, matches, shag tobacco, etc.[25]

> Sales clerks in Kazan have to listen to customers' complaints that sometimes stores have no spring or summer clothing or footwear, no stock of athletic goods, etc. The editors of the newspaper . . . have received letters from collective farmers who are puzzled to find no pails, pans, washbasins and other domestic items on sale in the villages.[26]

> There is a great demand for children's ski suits with napping but they are placed on sale sporadically.

> Many parents wish to obtain baize shirts. They are cheap, have beautiful patterns and, what is most important, they are warm. However, these shirts appear rarely and in insignificant quantities.[27]

> In the summer of 1953 I tried to get a pair of women's dress shoes repaired. But the Kiev shops had no leather soles. "Sometimes we have them," said the shopkeepers, "but right now we don't. Come back in a week."[28]

[23] F. A. Hayek, "Socialist Calculation: The Competitive 'Solution'," *Economica*, May 1940, VII, 135-37; reprinted in *Individualism and the Economic Order* (Chicago, 1948), pp. 192-94.

[24] Lange also thought that there might be some advantages in having free markets for consumer goods in a socialist economic system See O Lange and F. M. Taylor, *On the Economic Theory of Socialism* (Minneapolis, 1938), pp. 90-98.

[25] "Central Union of Consumer Cooperatives Does Little to Meet Consumers' Growing Demands," *Curr. Dig. Sov. Press*, July 28, 1954, VI, 49.

[26] "More Consumers' Goods," *Curr. Dig. Sov. Press*, July 11, 1953, V, 33.

[27] "Clothes and Shoes for Children," *Curr. Dig. Sov. Press*, Jan. 27, 1954, V, 20.

[28] "Where Can One Have Shoes Repaired?" *Curr. Dig. Sov. Press*, Apr. 7, 1954, VI, 41.

TABLE II.—ANNOUNCED PERCENTAGE REDUCTIONS IN THE PRICES OF CONSUMER GOODS IN THE USSR, 1948–1954, SELECTED ITEMS OR GROUPS*

Item	1948	1949	1950	1951	1952	1953	1954
Food							
Meat and meat products		10	24–35	15	15–20	15	
Fish and fish products		10	10–35	10		10[a]	
Macaroni products		10	25	15	15	10	5
Rye bread		10	25.9	15	12	10	8
Coarse wheat and rye flour		10	25	15	15	10	5
Butter		10	30	15	15	10	
Margarine			35	10	15	10	
Lard			18	10	20	10	
Local cheeses		20	15	10	10		
Eggs			15	10	15	10	
Table salt		30	40	21	30	10–20	20
Rice			12	15	15	10	
Tea			10	10	20	20[a]	10
Coffee				10	15	20	15[a]
Granulated sugar			15		10	10	
Mayonnaise and other dressings			20		30	10	
Ice cream			20	10	15	10	
Jams and jellies			25		10	10	
Canned fruits		10	30		10	25	
Dried fruits and nuts			20		20	20	
Apples and pears			20		20	50	[b]
Tangerines and oranges			15			50	[b]
Potatoes			10			50	[b]
Beets			10			50	[b]
Cabbage and carrots			14.7			50	[b]
Apparel							
Coarse wool fabrics		10	24				
Cotton fabrics			15			15	15–20[a]
Pure wool fine fabrics		10	12			5	
Linen fabrics			15			8	
Part silk and artificial silk fabrics			12				
Overcoats, suits, dresses and other wool clothes		12	10–22				
Stockings and socks			15–25			20[a]	10–25
Caps (fabric)		15	25–35			10–15	10
Leather footwear			15			8–10	7[a]
Rubber footwear			10–15			10–15	12[a]

[a] Average reduction.

[b] In August 1954, the prices of potatoes, fruits, and vegetables were raised, but the percentage increases for individual items on an annual basis are not known.

* Sources: L. Björk, *Wages, Prices and Social Legislation in the Soviet Union* (London, 1953), p. 146; "Price Cuts," *Curr. Dig. Sov. Press*, March 29, 1949, I, 44; "Price Cuts and the Gold Standard," *Curr. Dig. Sov. Press*, April 15, 1950, II, 16–18; "On New Reduction of State Retail Prices on Foodstuffs and Manufactured Goods," *Curr. Dig. Sov. Press*, April 14, 1951, III, 29; "New Reduction of State Retail Prices of Foodstuffs," *Curr. Dig. Sov. Press*, May 10, 1952, IV, 31; "Retail Price Cut Decree is Issued," *Curr. Dig. Sov. Press*, April 25, 1953, V, 4; "New Reductions in State Retail Prices for Food and Manufactured Goods," *Curr. Dig. Sov. Press*, May 5, 1954, VI, 16.

TABLE II—(*continued*)

Item	1948	1949	1950	1951	1952	1953	1954
Household Goods							
Kitchen utensils			10–30			10	
Household soap			40	15		15	15[a]
Kerosene			10	22		25	38
Matches			25	20		17	20
Tumblers and other glass			15	10		10–20	10[a]
Hardware		20	20	10		10	10[a]
Electric irons		10	25			15	
Washing machines						20	10
Iron bedsteads			20	20			15
Tables, chairs, cupboards, divans and other furniture				20		5	
Medicines and other supplies						15[a]	15[a]
Vitamins	20		20		10	10	
Household chemical supplies						10	10[a]
Wool blankets			20				
Lace and curtain goods			30				
Radio sets	10	20	15	10			
Cameras	10	10	20				10[a]
Pianos		20	25				
Phonographs	20	30					
Hunting and fishing accessories						10–15	10[a]
Jewelry		20	15				10[a]
Wrist watches	12	30	20	10		5	
Perfume	10	20	15–25	10		10	10[a]
Fountain pens			30			20[a]	15
Celluloid toys			20			10	15[a]
Needles			20			20	20
Writing paper			10			10	10
Cigarettes	10		20	10		5–10	
Vodka	20	28	16.7	10		11	
Beer	20		30			15	
Axes, spades, scythes, and pitchforks				10		20	20
Gasoline				20		25	44.5
Mixed fodder		20	25	15	15	10	5[a]
Carts, wheels, and wagon supplies						10	
Tires and tubes for light autos and motorcycles						10	
Bicycles	20	20	20	10		10	
Lamps and metal lanterns						10	20
Building Materials							
Window glass			20	20		10	
Wallpaper			20	10		20	20
Paints			10–20			10	10[a]
Cement		30	20			25	20
Plywood							15
Linoleum						15	
Stove castings						10	

The continuous gap between state and free prices is additional evidence of shortages in the state outlets for foodstuffs. If official prices were set so that demand at these prices just balanced the supply in the state stores, prices in the collective farm markets would be equal to the official prices. Several newspaper correspondents have reported that state prices were much lower than free market prices.[29] In 1954, Clifton Daniel reported that prices in a farm market near Moscow were 5 times as high for cucumbers, 4 times as high for potatoes, 2½ times as high for apples, and the same for tomatoes as in state stores.[30] In addition, a recent Soviet article reveals that state prices are occasionally far below the less rigidly controlled prices charged by the the cooperatives. It gives as an example a bookcase priced at 579 rubles by the Furniture Industry Artel, but sold for 235 rubles in the state stores.[31]

The Soviet press occasionally mentions types of informal rationing—such as queues, illegal extra payments, or limits to the quantity sold to one person. Some type of formal or informal rationing is inevitable when prices are set below equilibrium levels. A recent letter to a Soviet newspaper states that people have to stand in line to buy an automobile in Moscow and describes the market for automobiles in the following way:

> Unfortunately my trip was fruitless. There were more people trying to buy automobiles in Moscow than there were cars in the stores.
>
> I must mention that certain shifty enterpreneurs offered to "help" me buy an automobile on condition that I pay 10,000 rubles more for a Pobeda than its price.[32]

Another article reveals that in the market for building materials there are restrictions on the amount sold per customer per day:

> Last year I laid the foundation for my house with great difficulty. This year I received a loan of 10,000 rubles for private construction. But for two months now my wife and I have gone to stores and lumberyards to buy cement, bricks, boards, lumber, and other materials. It was no use. . . . We were not able to get anything.
>
> The Ukraine Republic Ministry of Trade does not concern itself with such a category of customers as private builders. The only buyers recognized are those for whom norms of 20 kilograms of cement, one cubic meter of wood, etc., are set. In order to obtain enough materials to build a house I would have to go to the store 100 times for cement, ten

[29] See E. Stevens, *This is Russia—Uncensored* (New York, 1950), pp. 44-51, and H. E. Salisbury, "New Soviet Prices Vary with Season," *New York Times*, Aug. 15, 1954, p. 10.

[30] C. Daniel, "New Soviet Line Favoring Farms," *New York Times*, Sept. 7, 1954, p. 6.

[31] Krondrashev, *op. cit.*, pp. 10-11.

[32] "Concerning the Automobile Trade," *Curr. Dig. Sov. Press*, June 23, 1954, VI, 34.

times for roofing, 25 times for lumber, etc. But since these materials are seldom in the stores, one can imagine the private builders' position.[33]

An indication of the seriousness of the shortages is that twice during 1954 Soviet leaders have passed resolutions to alleviate them. At a meeting of the cooperative organizations in July, a decision was adopted to "eliminate the absolutely intolerable instances of interruptions in trade of goods in everyday demand. . . ."[34] An August decree establishing seasonal prices for farm produce attempted to "ensure greater uniformity in selling it during the course of the year."[35]

Soviet writers usually attribute market shortages to negligence of officials, "Bureaucratic methods in management of enterprises," lack of order in the distribution of goods, production of profitable items rather than those most desired by consumers, failure to follow regulations, or dishonesty. One of the rare admissions that shortages are related to the price reductions is contained in a recent speech by the Minister of Trade. However, he also repeated the belief that setting prices of consumer goods where demand is greater than supply has a stimulating effect on labor because shortages obviously show that supplies are not sufficient. Even before the second world war, Soviet writers defended the setting of prices below equilibrium levels in this way. The Minister of Trade said:

> The increased real wages of workers, the rise in the living standard of the rural population and the systematic reduction of prices have all occasioned a rise in demand for consumers' goods which has out-stripped production of certain items such as meat and animal fats. Some people even have the impression that there are fewer goods to be had now than there were several years ago.
>
> There is a simple way of giving the illusion that there are enough goods and that is not to cut prices further, i.e., to prevent any increase in the public's purchasing power, as is done in capitalist countries. Then everyone will think that there are enough goods—and there will be enough goods: surpluses may even accumulate. But this is a violation in principle of both Soviet policy and the fundamental interests of the people. . . . If we are to get the better of the goods shortage, there is only one correct way open to us—to speed up the rate of consumers' goods production. This is the way the Communist Party has chosen.[36]

[33] "Where Can a Private Builder Buy Building Materials?" *Curr. Dig. Sov. Press*, June 6, 1953, V, 39.

[34] "Resolution of the Fourth Congress of Representatives of USSR Consumers' Cooperatives," *Curr. Dig. Sov. Press*, Aug. 18, 1954, VI, 26.

[35] "Decree on Seasonal Prices for Vegetables and Fruit," *Curr. Dig. Sov. Press*, Sept. 29, 1954, VI, 3-4.

[36] "Election Campaign Speeches by Soviet Leaders—II," *Curr. Dig. Sov. Press*, Apr. 28, 1954, VI, 3.

Actually, it is doubtful whether a low-price policy involving market shortages will have the beneficial effect on labor productivity claimed by Soviet leaders. High prices would probably indicate the need for increasing output just as effectively as shortages. Also, the inconveniences resulting from market shortages make shopping difficult and discriminate against employed persons and especially working wives.

Although the 1954 decree establishing seasonal prices for potatoes, vegetables and fruit raised their prices, Soviet planners probably do not intend to adopt a policy of lessening market shortages by raising prices. The 1954 action followed the unusually large reduction of 50 per cent in the prices of these foodstuffs in 1953, and it is the only known decree in the past seven years that has raised the prices of consumer goods. After years of government prices set far below equilibrium levels, market shortages probably seem normal to Soviet price administrators, and the populace has become accustomed to them.

It is important that conditions of market disequilibrium have not existed in the collective farm markets. At the higher prices in these markets, foodstuffs are usually available and shopping is much easier than in state stores. By providing some markets where shortages do not exist, peasant markets may have contributed significantly to the workability of the Soviet distribution system. However, it is interesting that in spite of their usefulness, the peasant markets are expected to disappear as communism develops.

IV. *The Problem of Minimizing Inventories*

There is probably an important, but unpublicized, advantage in setting prices below equilibrium levels. Low prices avoid the possibility of surpluses and keep inventories and storage costs at a minimum. The Soviet government has admitted that it has inadequate storage facilities, and it has attempted to encourage collective farms and consumers to store more foodstuffs.[37] During the postwar period when output was expanding rapidly, prices would have had to be set especially low to avoid eventual surpluses before the next price cuts were decreed.

Although the Soviet pricing system results in very small inventories, Dobb believes that inventories are extremely important in the Soviet distribution system. He writes:

> There are two main ways in which short-period variations in the supply-demand position of particular commodities can be met. One (which our Western textbooks have prejudiced us to regard as the normal way) is to allow short-period prices to fluctuate in response to the current supply-

[37] See "Decree on Seasonal Prices," *op cit*, p. 3, and "Zverev on Financial Discipline and Control," *Curr. Dig. Sov. Press*, Aug 30, 1952, IV, 4.

> demand relationship; and to regard a high ratio of short-period price to cost (or to some "normal value") as a *prima facie* reason for increasing supply in the ensuing plan-periods. The other is to keep prices (with some exceptions) in some fairly constant relationship to cost (or to "normal value") and to allow short-period variations in the supply-demand situation to result in varying rates of running-down of stocks (or even shop-shortages and queues). In this case priority for increased output in the next plan-period will presumably be assigned (other things being equal) to those commodities which show the quickest running-down of stocks or the longest queues. . . . The latter is a quite reasonable course to pursue, although it is not without its inconveniences for the consumer. In a period of rapid general improvement in the supply-position, however, such inconveniences may be regarded as relatively unimportant, and at any rate transitory.[38]

The "short-run economic problem" with which Dobb is concerned arises because within short periods, consumption frequently has to be adjusted and goods must be distributed with reference to an existing supply.[39] In a free enterprise system prices adjust consumption to production in the short run by rising when goods become scarce compared to demand and falling when they become abundant. As Dobb points out, these adjustments might also be performed by various forms of nonprice rationing such as queues. However, Dobb's suggestion that Soviet planners may be attempting to balance supply and demand in the short run by changes in inventory levels is very questionable. At present, Soviet prices appear to be set so low that retail inventories of many commodities do not exist much of the time. In order to have large enough inventories on hand to take care of short-run market fluctuations, prices would have to be so high that some merchandise would remain in stock even after demand at the official price had been completely satisfied. Such a system of distribution would undoubtedly require much larger storage facilities for consumer goods than exist in the Soviet economy at the present time.

Although the Soviet economy has had few surpluses resulting from setting prices above equilibrium levels, supplies of substandard goods or goods in unusual sizes have accumulated when official prices for them were too high. Because factories may fulfill their quotas by cutting quality or reducing variations in styles and sizes, goods that are difficult to sell at official prices are occasionally produced.[40] In 1953 there were large bargain sales to clear inventories of items that were unsalable at

[38] Dobb, *op. cit.*, p. 273.

[39] For a description of this fundamental economic problem, see F. H. Knight, *The Economic Organization* (Chicago, 1933), pp. 12-13, 78-82.

[40] See "The Consumer—Improve the Quality and Variety of Light Industry Products," *Curr. Dig. Sov. Press*, Feb. 8, 1949, I, 46.

official prices. In a recent speech the Minister of Trade described surplus conditions of this type:

> Whereas at the beginning of 1953 the trade network had a tremendous quantity of goods above plan left on hand, including unsalable goods of outmoded styles and of poor quality, in the year just ended the merchandise stocks left unsold above the established quotas have mainly been liquidated, while the quantity of unsalable merchandise has been substantially reduced.
>
> On the whole, surpluses in the trade network are now generally at a normal level.[41]

V. *Concluding Remarks*

Price reductions are probably superior to increases in money wages as a method of expanding consumption in a planned economy. The Soviet policy of inflation prior to the second world war had many disadvantages. Gerschenkron writes:

> There is no doubt that, in the past, inflation interfered considerably with efficient planning processes. It rendered difficult the ascertainment of relations between planned and actual cost of production in industry, and thus deprived the planners of their most important instrument for checking whether or not resources had been utilized in accordance with the plan. Furthermore, inflation provided the managers of industrial enterprises with a strong temptation to hoard raw materials, thus causing mal-allocations of resources within the economy, and further accentuating its character as a deficit economy and the disabilities and inefficiencies that flowed therefrom.[42]

The price reduction decrees are intended to be general welfare measures. Of course, price reductions in themselves would not make the Soviet people better off. Only increased availability of goods would do this. Also, farmers, who still comprise more than half the total labor force, have benefited much less than city workers. Because peasants are somewhat self-sufficient, they have benefited very little from the large cuts in state prices of foodstuffs. In addition, although employees' money incomes are stabilized, peasants' incomes fluctuate not only because they share in the variable output of the cooperative farms, but also because they still obtain a significant portion of their income from sales of farm produce in the free markets. Because of the dependence of the peasants on free market prices, the policy of stabilizing money incomes of employees, which causes free market prices to fall as farm output increases, tends to lower farm incomes. On the other hand,

[41] "Speech by Dep. A. I. Mikoyan," *op. cit.*, p. 12

[42] Gerschenkron, *op. cit.*, pp. 30-31.

it is interesting that price reductions in state stores have probably tended to maintain peasant incomes because state price cuts tend to retard the decline of free market prices. In addition, perhaps to offset the unequal advantages to farm and city workers, in 1953-54 farm incomes were raised by special measures such as lowering compulsory delivery quotas, reducing agricultural taxes, and raising the procurement prices paid by the state for obligatory quotas.

INPUT-OUTPUT ANALYSIS AND ECONOMIC STRUCTURE

A Review Article

By LEONID HURWICZ*

It was only after having undertaken[1] the review of the present volume[2] that the writer became aware of the magnitude of the task, comparable to that of appraising, say, a year's contents of a thriving periodical. Even the book's length (541 pages, not counting indices and "fold-in" charts) fails to give adequate warning of its tremendous scope and wealth of material.

As indicated in the preface, the volume is a product of the first three years of the Harvard Economic Research Project set up with the help of a Rockefeller Foundation grant, partly financed by U. S. Air Forces funds, greatly helped by the cooperation of the Bureau of Labor Statistics, and, of course, founded on the earlier accomplishments of Leontief and his collaborators.

The first four of the volume's twelve chapters are by Leontief. The first three ("Introduction," "Structural Change," and "Dynamic Analysis") comprise Part I, entitled "Static and Dynamic Theory." The fourth ("Interregional Theory"), together with Walter Isard's paper ("Some Empirical Results and Problems of Regional Input-Output Analysis") constitute Part II. Part III consists of two papers dealing with capital structure: "The Structure of Capital" by Robert N. Grosse and "The Telephone Industry: A Study in Private Investment" by Paul G. Clark. Part IV, entitled "Explorations in the Use of Technological Data," contains "Process and Production Functions from Engineering Data" by Hollis B. Chenery, "Problems of Classification and Aggregation" by Mathilda Holzman, "The Technological Structure of the Cotton Textile Industry" by Anne P. Grosse, and "Commercial Air Transportation in the United States" by Allen R. Ferguson. Part V ("Consumption and Final Demand") consists of "The Role of Demand in the Economic Structure" by James S. Duesenberry and Helen Kistin.

A striking characteristic of the "product-mix" represented (in variable proportions!) in this volume is the interplay of empirical results, methodological discussion, and theoretical model construction. Thus Leontief's "Structural Change," located in a part "reserved" for theory, is largely devoted

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[1] Following the untimely death of the previously designated, and much more suitable, reviewer—Professor A. Henderson of the Carnegie Institute of Technology. The present reviewer profited from reading Henderson's multigraphed paper, dated June 30, 1953, entitled "The State of Input-Output Analysis."

[2] Wassily Leontief, and others, *Studies in the Structure of the American Economy—Theoretical and Empirical Explorations in Input-Output Analysis* (New York: Oxford Univ. Press. 1953. Pp x, 561. $11.00). Referred to as *Studies* in this article.

to the presentation and analysis of the empirical data on input-output coefficients in 1919, 1929, and 1939; at the same time, the paper has a mathematical appendix containing the derivation of certain algebraic relations relevant in analyzing the phenomena of structural change. Similarly, papers by Clark, Chenery, Holzman, Duesenberry and Kistin (the listing is not meant to be exhaustive!) are of considerable interest not only as empirical monographic studies, but also as contributions to methodology and economic theory.

Among the empirical studies, as can be seen from the titles, some are focused on one sector of the economy defined in terms of a commodity or industry; others cut across the whole economy, though with emphasis on a specific aspect (structural change, interregional structure, capital structure). Theoretical models largely correspond to the empirical materials handled, although not necessarily with the same scope or emphasis. Thus Leontief's dynamic theory goes much beyond the empirical use made of the available time series, while the theoretical basis underlying the computation of the inventory coefficients is rather played down.

Methodological problems arising in the treatment and interpretation of empirical data are discussed in almost every paper of the *Studies*. Some (as in the paper by Duesenberry and Kistin) are essentially in the domain of the theory of statistical inference. Some (*e.g.*, Holzman) deal with statistical decisions (unrelated to sampling issues) such as those of aggregation. Others (*e.g.*, Chenery) are concerned with the fitting of theoretical analysis together with the available statistical materials. Leontief himself raises a host of fundamental questions concerning the role of theory and empirical analysis in economics.

The detailed appraisal of each of the contributions in the *Studies* would take the reviewer far beyond the limits of his competence. It seems, therefore, preferable to follow up some of the issues common to most of the papers in the volume and try to answer (or at least formulate) some of the questions that are likely to be asked by an economist. This selection, unfortunately, is unfair to some of the contributors; let it be emphasized that it reflects not the reviewer's value judgment but his limitations.

I. *The Basic Model*

Leontief's basic static model, well known from his earlier writings and conveniently summarized at the beginning of Chapter 2, consists of two sets of relations: the balance equations and the structural equations. Each balance equation states that the total output of a given industry is absorbed either by itself or by other industries, or by the "outside" sector (*e.g.*, consumption). If the number of industries (apart from the "outside" sector) is m, the *balance equation* for the ith industry may be symbolically written as

$$X_i = x_{i1} + x_{i2} + \dots + x_{im} + y_i$$

where

X_i is the total output of the ith industry,

x_{ik} is the amount of product of the ith industry absorbed by the kth industry,

y_i is the amount of the product of the ith industry absorbed by the "outside" sector.

The listing of the amounts absorbed by the "outside" sector ($y_1, y_2 \dots, y_m$) is called the "bill of goods." The ratio of the amount of the ith industry's product absorbed by the kth industry to the output of the kth industry may be called the ith *technical coefficient* in the kth industry, and is denoted by a_{ik}. Thus, in terms of the notation just introduced, $a_{ik} = x_{ik}/X_k$; this relation, when solved for x_{ik} becomes

$$x_{ik} = a_{ik} \cdot X_k$$

and is called a *structural equation.*

In the present volume this scheme is extended to cover situations involving interregional ("intranational") and dynamic analysis.

For interregional purposes it is, in principle, sufficient to split each industry into as many regional subindustries as there are regions and then write out the balance and structural equations for each of the subindustries; a simplification results if the technical coefficients do not vary from region to region, and percentage distribution of each commodity's output among regions is given. (Some commodities are assumed only to travel within the region of production.)

For purposes of dynamic analysis, one takes into account the fact that some of the output of a given period goes into stocks (capital goods or inventories). The stocks are assumed parceled out among the m industries, although the possibility of the "outside" sector holding stocks is not ruled out. If S_{ik} denotes the stock of the ith commodity held by the kth industry and $\dot{S}_{ik}$ the increase[3] (positive, zero, or negative) in S_{ik} over the given period, the balance equation of the ith industry now becomes

$$X_i = x_{i1} + x_{i2} + \dots + x_{im} + \dot{S}_{i1} + \dot{S}_{i2} + \dots \dot{S}_{im} + y_i$$

which merely says that the output must be absorbed by some industry, either on current or capital account, or else be used by the "outside" sector.

The ratio of stock of the ith commodity used by the kth industry to the output of the kth industry may be called the ith *stock (capital) coefficient* in the kth industry, and is denoted by b_{ik}, so that $b_{ik} = S_{ik}/X_k$. The equivalent relation

$$S_{ik} = b_{ik} \cdot X_k$$

is referred to as a *structural stock-flow equation.*[4]

[3] More precisely, all entities are regarded as instantaneous rates. $\dot{S}_{ik}$ is then the time derivative of S_{ik}.

[4] If $\dot{X}_k$ denotes the (positive, zero, or negative) increase in output of the kth industry, the stock-flow equation (if regarded as invariant) implies the "pure acceleration" relation $\dot{S}_{ik} = b_{ik} \cdot \dot{X}_k$. Leontief's more sophisticated "multiphase" model, as well as the empirical work of R. N. Grosse and Clark, takes into account the irreversibility of the accumulation process. In Grosse's work $b_{ik} = S_{ik}/\overline{X}_k$ where $\overline{X}_k$ is the capacity (rather than current output) of the kth industry.

II. *The Constancy of the Structural Coefficients*

Ex post one can (in principle) always obtain the so-called *structural coefficients* (the a's and the b's) if the required data on output and stocks (the x_{ik} and the S_{ik}) are available.

That such knowledge is extremely useful, there is no doubt; Leontief and his collaborators would have deserved thanks from economists, theoretical and applied, if they had merely determined the historical values of these entities. But, as the term "structural" indicates, Leontief and his group think of the a's and b's as having a considerable amount of *invariance*. With some oversimplification, the nature of this invariance may be stated as follows: Suppose that the a's and the b's have been computed on the basis of a given year's data. Imagine now that the same year is to be "relived" by the nation, with a different bill of goods and a different set of outputs. Again, the a's and the b's are computed from the "relived" year's data. They would be the same as those originally obtained! Hence, in a static model, the output X_k and the interindustry flows x_{ik} can be obtained, given the bill of goods and the knowledge (based on, say, past observations) of the technical coefficients. Similarly, in a dynamic model, the time paths of stocks, outputs, and interindustry flows can be obtained, given the time paths of the bill-of-goods components together with the knowledge of the structural coefficients and of certain initial values. (The mathematical procedures involved in the solution are described in considerable detail in Chapter 3, but the situation would be further complicated by taking into account the fact that neither outputs nor stocks can be negative.)

The postulate of invariance of the structural coefficients does not mean that the a's and the b's must remain the same from year to year. Indeed, Chapter 2 is primarily devoted to a comparison of the values of the technical coefficients (a's) in 1919, 1929, and 1939, but these changes, called "structural," are interpreted in terms of technical progress and similar phenomena. Yet traditional economics does not require the hypothesis of technological change to account for the change of the input-output ratios! The usual classroom picture of a production function is not a straight line through the origin but a curve, often S-shaped, exhibiting in its various phases the phenomena of increasing, constant, as well as decreasing returns; the typical isoquant map allows for variations in the ratios of the different inputs to each other; similarly for joint outputs. Furthermore, the traditional theory of the firm depends on the nonlinearity phenomena.

Superficially, the situation is distressing. For it seems that there are two irreconcilable approaches in economics: one where everything is proportional and the coefficients fixed, the other where the absence of proportionality and coefficient fixity is the cornerstone of the theoretical structure. However, while it would be unrealistic to deny divergence of emphasis and specializing assumptions, one takes comfort in the fact that the developments of the last decade have resulted in a theoretical structure broad enough to accommodate both the traditional (curvilinear) and the fixed coefficient (linear homogeneous) models as special cases of a more general model, to be

here called the ***generalized activity model*** (which is an extension of "activity analysis" encompassing nonlinear, as well as linear, processes[5]). Among the situations covered by the generalized activity model are: the linear programming model (of which Leontief's input-output model may be considered a special case), and the traditional curvilinear model (as, say, in Allen or Hicks). The fundamental feature of the generalized activity model is that, unlike traditional economics, it goes beyond commodity amounts and looks at the processes (activities) which use up or produce these commodities. Given the levels (intensities) of all activities, the inputs and outputs are assumed to be uniquely determined, regardless of levels of the other activities. If one then assumes independence (additivity), the total net (positive, zero, or negative) output of a commodity is obtained by summing the outputs attributable to each of the activities. (If an activity level is zero, so is its output of every commodity.)[6]

Since the activity level determines both inputs and outputs, it can be eliminated to yield relationships between the inputs and the outputs. In linear programming it is assumed that every input and every output is proportional to the activity level, hence (for a given activity!) the input-output (as well as input-input and output-output) ratios are constant. But even in the linear programming models these ratios are different for different activities, hence may change from one period to another because of resource limitations, price considerations, etc. (In nonlinear models the ratios may, of course, change *within* a given activity.)

There are several indications that the contributors to the *Studies* do think of their models as embedded in such a generalized activity model. Leontief's remarks on pages 32-33 may be interpreted as describing "structural change" in terms of some activity levels going down to zero while others, previously zero, have become positive. Chenery's "process functions" are designed to describe the (not necessarily linear) relationships characterizing a single activity (process). Holzman's comments (pp. 343, 357-59) deal with nonlinearities and variations in the process-mix. Also, Leontief's more sophisticated dynamic model (pp 68ff) takes into account the variability of the

[5] Including the possibility of a continuum of processes

[6] Where the number of activities is finite (say q) the model may be stated as follows: Denote the level of the pth activity by w_p and the total net (positive, zero, or negative) output (due to all processes) of the ith commodity by v_i. (The number of activities q may be larger than the number n of commodities. The list of commodities includes labor.) The fundamental technological relation for the ith commodity states that $v_i = f_i(w_1, w_2, \ldots, w_q)$, *i.e.*, that the choice of levels for all the activities uniquely determines the output of each commodity (the f_i are single-valued functions). When additivity is postulated, the total output may be split into parts attributable to the separate activities so that $v_i = v_i^1 + v_i^2 \ldots + v_i^q$ where v_i^p denotes the output attributable to the pth activity; in turn, $v_i^p = f_i^p(w_p)$, with $f_i^p(0) = 0$. The linear programming model is then obtained by requiring that $f_i^p(w_p) \equiv c_i^p w_p$ (with c_i^p constant), *i.e.*, that the ratios of outputs to activity levels be independent of those levels. The basic Leontief (open) input-output model is then obtained by requiring that $q = n - 1$ which (within the linear programming model) may be justified on grounds of efficiency. The "traditional" curvilinear models are analogous; they may be regarded as postulating a continuum of activities and nonlinear process relations f_i^p

capital coefficients (the *b*'s) depending on whether the output is rising or falling.

Yet a good deal of the exposition is based on the assumption of constancy of the structural coefficients. This does not matter when one is merely providing a historical description of a given year. But where policy recommendations or predictions are envisaged—and Leontief's section on "policy decisions and the open system" (pp. 65-68) shows this to be the case—the assumption that variations in the bill of goods (as distinct from technical progress, exhaustion of natural resources, changes in consumer tastes[7]) would leave the technical coefficients unchanged must be questioned.

The reviewer finds it genuinely difficult to determine in what spirit the assumption of coefficient constancy is being made.

Is it adopted primarily to simplify exposition and presentation of the data? This interpretation suggests itself very strongly in the light of remarks made (p. 94) in connection with a relation which is assumed to be one of proportionality although Leontief believes it to be linear nonhomogeneous (*i.e.*, nonproportional). The reason given for adopting the assumption under the circumstances is that "since . . . no reliable empirical measures . . . are yet available, no useful purpose can be served by incorporating them [*i.e.*, the nonproportionalities] in the present theoretical formulation." In effect Leontief seems to be saying the following: "In the *xy* plane I have one point through which my line (representing the relationship) must go; if I do not have another point, I might as well draw it through the origin, even though I know it probably, does not pass there." (Similarly, if only one point is given on a curve going through the origin, one might as well draw it as a straight line.) This may be quite acceptable as an expository device, but is obviously dangerous in situations where the policy (or predictive) implications would be different depending on whether a line through a given point does or does not go through the origin. In such a case, an arbitrary choice of the origin as the second point might create the incorrect impression that the available data are adequate for policy (or prediction) purposes.

There are, however, alternative interpretations of the constant coefficient assumption. Thus one might be quite willing to regard the assumption as a valid approximation for certain small displacements of the system. But what about the large displacements? Even if the linear programming model is assumed (so that the input-output ratios are constant for each activity), changes in the process-mix could be expected to bring about variations in the historically observed input-output ratios quite independently of technological progress. The "traditional" economist would naturally expect to observe these variations, especially if the price ratios (or the composition of the bill of goods) underwent a strong change. Yet it has been shown[8] that even with a

[7] See p. 20.

[8] See the following contributions in *Activity Analysis of Production and Allocation, Proceedings of a Conference*, edited by Tjalling C. Koopmans, Cowles Commission Monog No. 13 (New York, 1951): Ch 7, "Abstract of a Theorem Concerning the Substitutibility in Open Leontief Models," by Paul A. Samuelson; Ch. 8, "Alternative Proof of the Substitution Theorem for Leontief Models in the Case of Three Industries," by Tjalling C.

changing bill of goods all efficient production possibilities are characterized by the same input-output ratios, provided it is assumed that for the so-called basic activities constant returns prevail, there is no joint production, every activity requires the use of labor, and labor is the only primary input. While it is not difficult to construct examples involving the violation of these postulates, there may be important situations where the postulates are likely to be satisfied. Thus Leontief's empirical case is stronger than one might at first believe.

In any case there is little doubt that the constant-coefficient model is extremely convenient and should be used where applicable. On a priori grounds one would expect it to be close to reality in some situations,[9] wide off the mark in others. But if the data, embodying so much industry and ingenuity, are to be used for prediction or policy, the coefficient-constancy assumption must be examined in the light of the observed phenomena. Until this analysis has been carried out, those postulating constancy for purposes of prediction or policy rather than exposition are open to Leontief's criticism (Ch. 1) for letting the theory get too far ahead of the empirical knowledge.

III. *Technology versus Behavior*

In "traditional" economic models the knowledge of the bill of goods and of the technological relations does not suffice to predict the output levels of the different intermediate and primary commodities. To make such a prediction one must also know whether firms are maximizing profits (or following some other behavior principle) and, if so, what the price relationships are.

In a constant coefficient model, on the other hand, the bill of goods determines the output of each commodity in a unique fashion Thus the constant coefficient approach seems to free us of the need for studying the complex problems of the firms' behavior patterns and market relationships. In fact, Leontief's remarks (p. 15) about the nonexistence of a discipline of economic psychology make one feel that he might regard it as unsound to have the behavior patterns brought into the picture.

Yet it is not easy to keep them out of the picture, especially when dynamic phenomena are being analyzed. The "irreversibility" of the accumulation process is a case in point. As Leontief points out (pp. 68ff.), while expansion in output (with capacity already fully utilized) may call for a proportionate increase in fixed capital, a decline in output would not result in a proportionate reduction in machinery and equipment. But this is not a purely technological phenomenon: with sufficiently pessimistic expectations and favorable scrap prices it might indeed pay to dismantle the plant.[10]

Koopmans; Ch. 9, "Alternative Proof of the Substitution Theorem for Leontief Models in the General Case," by Kenneth J Arrow; Ch 10, "Some Properties of a Generalized Leontief Model," by Nicholas Georgescu-Roegen. A generalized formulation, based on less restrictive postulates, is possible.

[9] See R. N. Grosse, p. 186, where theoretical arguments in favor of the capital-coefficient constancy are given.

[10] In discussing the possible indeterminacies and contradictions of the "multiphase" dynamic model Leontief hints (p. 75) at the "deeper layers of structural relationships,"

Clark's analysis of the determinants of investment in the telephone industry starts with the "pure acceleration" (proportionality) model, but then introduces such behavioral elements as "spare capacity," "irreversibility," and expectations of output. He recognizes (p. 250) that his modified model (the "capital requirements theory") is implicitly based on the profit maximization principle, and compares his model with a more "conventional," although unnecessarily crude, profit maximization approach. The crucial difference between the capital requirements theory and the "conventional" model described by Clark is that the former makes investment decisions insensitive to price ratios in general and to interest rates in particular. (There might, of course, be indirect sensitivity, since output expectations are not unrelated to the general condition of the market.) If, as Clark argues, the historical experience of the Bell System does indicate such insensitivity, the explanation is probably to be sought in the discrete nature of the capital variables and the presence of "corner optima." Thus Clark's model could (as he realizes) be fitted into a more sophisticated "conventional" model. An investigation of the problem from this viewpoint might be helpful in determining the class of situations in which the price insensitivity phenomena are likely to be observed.

The problem of price effects is also briefly considered by R. N. Grosse in his study of the structure of capital. He cites (p. 186) the switch from steam to Diesel power as an exceptional case where prices (in this case the coal miners' wage rate) did alter the capital coefficients and goes on to say: "But it is our view that exceptional cases of that sort do not occur frequently enough to destroy the usefulness of the fixed capital coefficient concept." In the reviewer's opinion, the preceding statement should be regarded as an empirical conjecture to be subjected to the usual procedures of verification. In the absence of systematic data on the subject everyone is entitled to follow his own hunch. The contributors to the *Studies* seem inclined to favor the hypothesis of price insensitivity. The reviewer, perhaps unduly impressed by the thinking and what Friedman has called the "casual empiricism" of many generations of economists, would expect to find price sensitivity in many important areas of the economic process.

Even those favoring the fixed coefficient hypothesis for capital equipment might hesitate with regard to inventories. R. N. Grosse states (p. 188) that "speculation may play a significant role in determining actual holdings"; hence, "they have been adjusted where possible to eliminate stocks exceeding what might be called the normal inventory stocks." For an input, these "normal" stocks are those said to be "required" by the users of the commodity and are assumed proportional to the user's level of output. Again, one might

but it is not clear whether these would be of a behavioral nature. With reference to a centrally guided system (*loc. cit.*), he does envisage the possibility of applying "certain maximizing rules." Incidentally, one wonders whether the contradictions would not disappear if the "anonymous" differential relations postulated by Leontief were replaced by difference equations (with arbitrarily short lags where desirable), each equation describing the behavior of a well-defined type of economic unit at time t, given the state of other variables at time $t-\tau$, $\tau>0$, and subject to technological restrictions and accounting identities. (If the relation system were complete, in the sense that the behavior of every type of unit was specified, one would also expect to avoid indeterminacies.)

expect that considerations of profitability, safety, and convenience would lead away from the simple proportionality idea with regard to inventories, just as was the case with regard to capital equipment in Clark's study of the telephone industry, but additional empirical work is needed to clarify this issue.

It would be surprising if economic analysis could be carried on successfully in ignorance of the principles guiding human behavior in connection with the decisions affecting production, construction of capital equipment, and the size of inventories.

IV. *Statistical Methodology*

The postulate of coefficient constancy, together with the related de-emphasis of behavioral aspects of the economic process leads to an attitude toward statistical procedures that, on the surface at least, differ greatly from that of other econometricians.

With considerable oversimplification, the reviewer sees input-output analysis as the process of "fitting" a one-parameter curve (a straight line through the origin) to a one-dot scatter diagram. If the curve to be "fitted" had two or more unknown parameters, no unique fit would be possible; in the jargon of recent theory, the relations would not be "estimable." Thus the formulation of a model where each relation has only one unknown parameter may be viewed as corresponding to the a priori identifying restrictions of the simultaneous equation models. Whether these (constant coefficient) a priori assumptions underlying Leontief's analysis are better founded or more realistic than those used in, say, Klein's models of the United States economy has not been established.

Now if a worker is unwilling to adopt the Leontief brand of simplifying restrictions, while still faced with one observation per (disaggregated) relation, he is forced to choose between a disaggregated but nonestimable model and one of the following two alternatives: a model which is made estimable at the (admittedly very serious) cost of considerable aggregation of variables, or any device which will yield more than one observation per relation. On the technological side, experimentation is, of course, the ideal answer and the volume's advocacy of engineering data is highly appropriate.[11] But where behavioral aspects of the structure are to be studied, experimentation is usually (though not always) ruled out and one is forced to resort to the examination of the history and time patterns of the relevant variables. Examples of this are to be found in Clark's (informal) test of the null hypothesis that prices and interest rates do not influence investment decisions, as well as in the Duesenberry-Kistin investigation of the demand function for certain consumer goods. Indeed how could one appraise the effects of price variations except by comparing different situations (not always obtainable at any one time point) in which different prices prevailed? The reviewer finds it, therefore, difficult to agree with the implications of Leontief's highly picturesque diagnosis (p. 7): ". . . in their desperate search for sufficiently large 'samples,' the

[11] Interestingly enough, when these data are used as is the case in the papers by Chenery and Anne P. Grosse (*cf* pp. 373-74), the emphasis on constant proportions largely disappears

proponents of indirect statistical inference found themselves driven toward the treacherous shoals of time-series analysis." The analysis of time series does indeed present special and serious difficulties, but these cannot be avoided except at the cost of neglecting the study of behavioral aspects of the economic structure and even certain purely technological phenomena.

Similarly, except for classroom purposes, the use of models more highly aggregated than those dealt with in the *Studies* is not a matter of a methodological predilection (as seems to be surmised by Leontief on page 6), but rather an unavoidable choice dictated in certain situations by the limitations of the data available (including even the highly disaggregated input-output figures) in relation to the number of parameters to be estimated.

Most workers in this field could probably agree on the ideal of having data which are highly disaggregated (as to commodities and processes), split by decision units ("cross-section"), and available for a sizable time period. But in the meantime one is forced to use data deficient in at least some of these respects. Economics is too poor to be able to discard any source of information, be it aggregated time series or disaggregated one-time-point observations, despite their admitted weaknesss.

One natural consequence of the use of one-observation samples is that sampling variation and error cannot be estimated. Hence the emphasis (and impressive sophistication) with regard to possible biases due to alternative classification and disaggregation methods (*e.g.*, Holzman), but little about the probabilistic aspects of the problem. An outstanding exception is, however, found in the Duesenberry-Kistin study[12] of demand for consumer goods. Here the non-observable stochastic component is explicitly introduced into the demand relations and the problems of bias due to possible correlation between the disturbance and the "independent" variables, as well as that of error in the "independent" variables, are openly faced. The issue is, of course, identical with that of the "single equation approach" bias discussed in the literature of the simultaneous systems. (It should be made clear that many other sources of estimation bias are also considered.) The demand study shows remarkable ingenuity in eliminating some of the sources of variation and the utilization of available data. Its findings (that demand elasticity for food is higher than estimated by Girshick and Haavelmo and that the hypothesis of "mysterious and arbitrary changes in taste" is not needed to explain the observations) are interesting and very important. Yet the authors are afraid (p. 477) that "it may be said that what we have done is to find the errors and then explain them away by postulating shifts in demand," though they defend themselves against such a charge. In the reviewer's opinion, there is only one way of avoiding this type of difficulty. Regardless of the path of discovery, the final results must be presented in the following conditional form: "If one adopts the class of a priori admissible hypotheses[13] (here the underlying assumptions are completely specified), the following are the (best unbiased, maximum likelihood, or whatever is applicable) estimates of (say) the elasticity coefficients based on

[12] Which is not of the one-observation type.

[13] *I.e.*, the statistician's large omega, representing assumptions which, in a given context, are regarded as firmly accepted rather than subject to testing

such and such data." The validity of such a statement is independent of the authors' state of mind and may be accepted or rejected by readers depending on their attitude toward the specification, estimation principle, or the reliability of the data.

The type of analysis represented by the *Studies* is of tremendous value and importance to the development of the science of economics and it is only natural that there should be controversy concerning certain aspects of its methodology and the domain of its applicability. It is important that this work be continued and that its relationship to other streams of thought in contemporary economics and econometrics be intensively explored. In the reviewer's opinion, such an exploration will typically reveal complementarity rather than substitutability.

LÖSCH ON LOCATION

A Review Article

By STEFAN VALAVANIS*

The Economics of Location[1] belongs to that class of works, of which each generation produces very few, that both introduce a new subject and exhaust it. As with the *Theory of Games*, or Keynes' *General Theory*, the main ideas are few and appear utterly simple once popularized. They are *fortunate* ideas; that is, they have many consequences that matter and that are not obvious.

My task is to sift and present simply Lösch's key ideas and results, to point out which of them have and which have not analogues elsewhere in economics, and to show which areas of economics are affected by his contribution.

Even if the earth's surface were perfectly homogeneous, it would become differentiated into farms, cities and roads for purely economic reasons. Economic activities would arrange themselves into honeycombs of regular hexagons. Regions would emerge with characteristic prices and wages, and would trade their characteristic products.

The purely economic reasons for spatial differentiation in the absence of historical or geographical accidents are three: economies of scale, transport costs and agriculture's need for space. With economies of scale and no transport costs whatever, all production would be concentrated in one, or a few, optimum-sized plants located at random. With transport costs and no economies of scale, a little of every product would be produced on every square inch of the earth's surface. With both economies of scale and transport costs, the result is intermediate: several production sites at definite distances compromise between mass production and freight costs. This is what happens if space as such is not an ingredient of production, as is approximately true in industry. In agriculture, however, acreage itself is an input. This fact alone, if there were no economies of scale or transport costs, would squeeze nonagricultural production into small sites.

Unquestionably, spatial differentiation will develop. What will it look like?

Price funnels and demand cones. Let population be equally dense everywhere and let all people have like tastes. If d, in Figure 1, is an individual demand curve for beer, and OP is the price at the brewery, which is at P,

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[1] August Lösch, *The Economics of Location*, translated from the second revised edition by William H. Woglom with the assistance of Wolfgang F. Stolper (New Haven: Yale University Press, 1954). The German title is *Die räumliche Ordnung der Wirtschaft; eine Untersuchung über Standort, Wirtschaftsgebiete und internationalen Handel* (Jena: Fischer, 1943). The Yale University Press has kindly given permission for the reproduction of Figures 20 (p. 106), 26 (p. 117), 28 and 29 (p. 125), and Table 7 (p. 119) in the book, which here appear as Figures 1, 5, 7 and 8, and Table I. Figure 2 is adapted from Figure 21 (p. 106) in the book

those living there will buy *PQ* bottles of beer. Farther away the price is higher by the amount of the freight, and the quantity demanded consequently smaller. At *F* no beer can be sold at all. Total sales are equal to the volume of the cone produced by rotating triangle *PQF* (Figure 1) around *PQ*. The brewery is surrounded by a *demand cone* (Figure 2) and by a *price funnel* (Figure 3) which is steeper the higher the freight per mile. The brewery's *sales area* is a circle of radius ρ. Likewise, its *supply areas* of barley, hops, and labor are circles of various sizes around *P*.

As long as profits are made, new breweries are established. Competition squeezes together the round sales areas into equal regular hexagons until both brewery profits and beerless areas have disappeared. Of all regular patterns

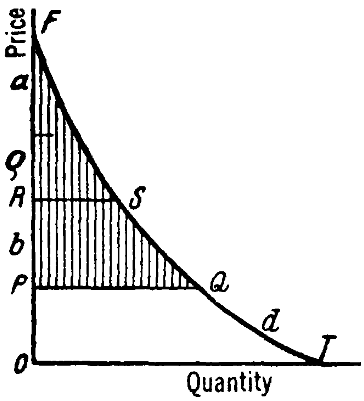


Fig 1 Demand

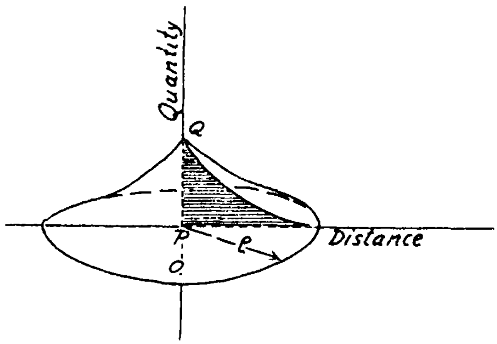


Fig. 2 Demand Cone

that can fill up the space, the honeycomb of hexagons minimizes total transport costs. This is true for every commodity. On the other hand, the size of the hexagons depends solely on the individual demand for beer, and on freights for beer and its raw materials.

This proves too much. If the criterion is minimum transport costs, why are they not eliminated altogether by people living right at the breweries? It is true that the optimum distance between breweries may not be optimum for bakeries or laundries, so that some transport costs would persist. However a best average distance could be found and people would group together in equally spaced identical settlements, each having a brewery, bakery and laundry.

Duality between agriculture and industry. Now we appreciate the full force of Lösch's distinction between agriculture and industry. Agricultural production is areal, industrial production is punctiform. The best location for the consumption of industrial goods is the city, whereas the best one for consumption of food implies an even distribution of the people. As long as products of the soil are an important item of demand, population will be scattered, if not continuously at least evenly, like polka dots, over the land.

Punctiform industry selling to areally spaced customers is characterized by *price funnels*. Conversely, areal agriculture selling to a punctiform city

is characterized by *crop gradients*—the continuous counterpart of Thünen's rings. This easy result, based on the duality between agriculture and industry, illustrates again Lösch's Midas touch.

Discontinuous settlement. There are two reasons why population should be scattered like sparse polka dots: (1) It is the best compromise between proximity to food and proximity to industrial production. (2) It is best for certain aspects of agricultural production. Shelter for cattle, the farm house,

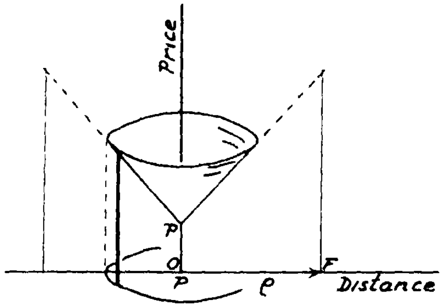


FIG. 3 PRICE FUNNEL

the well, are not areal but punctiform, and some farm operations resemble those of the brewery. Hexagonal farms are best.[2] Farm houses will then be laid out on a 60-degree lattice (Figure 4).

Market sizes. Discontinuous settlement restricts the possible market sizes. If I publish a rural newspaper, I do not care how far from the printer's is the nearest or the remotest corner of my subscribers' farms, because the newsboy has to deliver to the house.[3] If a circulation of 7 copies is economical each newspaper serves an area like Figure 5. If a circulation of 9 is indispensable, my sales area (Figure 6) will include the seven original customers at N, H_1 to H_6 plus one-third of the six farms J_1 to J_6 of the next ring. The other two-thirds read rival newspapers like N_1. Circulation of 7½, 8, or 8½ and a hexagon intermediate between Figure 5 and Figure 6 is impossible, not because of discontinuity in the number of copies that can be produced, but because of discontinuity in the number of customers that can be found for them.[4]

Now a few definitions, yielding a jackpot of results:

n the number of *equivalent customers.* If a customer, like J_3, is on a boundary, he is divided up equally by the number of suppliers on whose areas he verges. In Figure 6, each J-customer is divided by 3. The J's then add up to 2 equivalent customers for supplier N, who has altogether 9 equivalent customers.

[2] Lösch's treatment here is incomplete. See page 115, note 12

[3] Or the mailbox, which is also on a 60-degree lattice of mailboxes

[4] Lösch does not notice that the tendency toward discontinuity of area sizes is helped from the input side A brewery gets its barley and hops from barns at $H_1, \ldots H_6$ and not from all over the farm. Barley grown at A (Figure 6) goes to N_2, while barley grown at B (which is farther than A) goes to N.

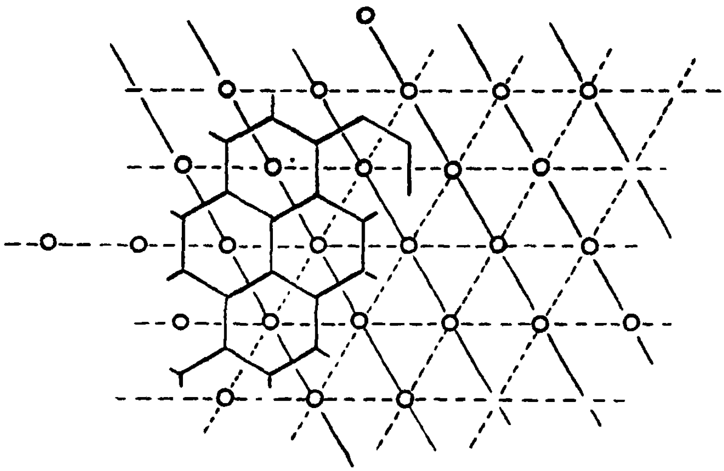


FIG. 4 SIXTY-DEGREE LATTICE

b the distance between towns that produce rival products.
a the distance between original settlements.

Results:

(1) $b = a\sqrt{n}$; that is, the distance between two like enterprises is proportional to the square root of the number of equivalent customers.

(2) The size of a market area is always $a^2 n\sqrt{3}/2$.

(3) The number of equivalent customers increases by jumps according to the law

$$(3.1)\quad n = (k\sqrt{3})^2 + j^2$$

$$(3.2)\quad n = [(k + \tfrac{1}{2})\sqrt{3})]^2 + (j + \tfrac{1}{2})^2$$

where j runs the integers from 0 to k first according to (3.1) and then according to (3.2), and where k runs the integers from 1 to infinity. Thus the seventeen smallest market areas have 3, 4, 7,

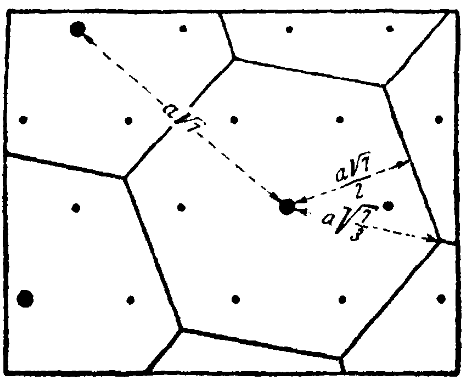


FIG. 5 MARKET AREA $n = 7$

TABLE I.—THE FIFTEEN SMALLEST MARKET SIZES

Area No.	n	Area No.	n
1	$(1\sqrt{3})^2+0^2=3$	3	$(1\frac{1}{2}\sqrt{3})^2+(\frac{1}{2})^2=7$
2	$(1\sqrt{3})^2+1^2=4$	4	$(1\frac{1}{2}\sqrt{3})^2+(1\frac{1}{2})^2=9$
5	$(2\sqrt{3})^2+0^2=12$	8	$(2\frac{1}{2}\sqrt{3})^2+(\frac{1}{2})^2=19$
6	$(2\sqrt{3})^2+1^2=13$	9	$(2\frac{1}{2}\sqrt{3})^2+(1\frac{1}{2})^2=21$
7	$(2\sqrt{3})^2+2^2=16$	10	$(2\frac{1}{2}\sqrt{3})^2+(2\frac{1}{2})^2=25$
11	$(3\sqrt{3})^2+0^2=27$	15	$(3\frac{1}{2}\sqrt{3})^2+(\frac{1}{2})^2=37$

9, 12, 13, 16, 19, 21, 25, 27, 28, 31, 36, 37, 39, and 43 equivalent customers. (See Table I.)

Systems of networks. With uniformly distributed population (continuous or not) each industry has its characteristic size of hexagon and divides space with a honeycomb of such hexagons. Now if two or more honeycomb-shaped nets are thrown on a table at random, thread-density is neither uniform nor random. There are local bunchings of thread, and because of the regularity of the several nets, equally complex bunchings form logical patterns on the table. The same is true of the hexagons' centers. They bunch into regular patterns. Now and then in a small neighborhood we find both a brewery and a bakery, or both a bakery and a laundry. More rarely a neighborhood con-

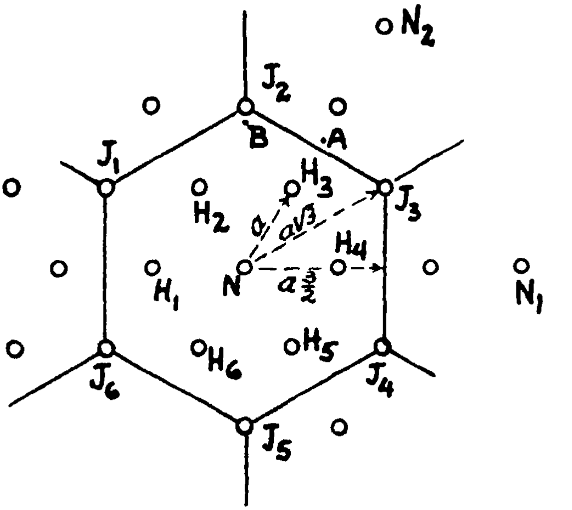


FIG. 6 MARKET AREA WITH $n=9$ EQUIVALENT CUSTOMERS

tains all three industries. Industrial centers, in other words, emerge in spite of continuous and uniform population.

Now suppose that hexagon nets randomly thrown together are no longer of continuously varying diameters, but come in a few assorted sizes. Bunchings and patterns of bunchings become more likely, because now the few assorted diameters have lowest common multiples, which was not true before. When farm houses are laid out as in Figure 4, the tendency for industrial concentration, low prices, high wages, and much commuting is intensified.

Urban cogwheels. We now lay honeycomb nets of the possible sizes together so that they have at least one point, the metropolis, in common (Figure 7). We rotate the nets so as to get a cogwheel pattern of six sectors with few and six with many production sites (Figure 8). With this arrangement (1) the

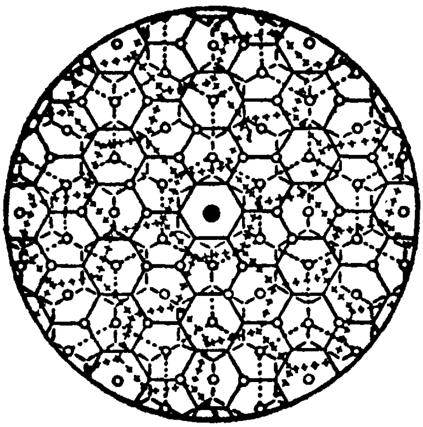


FIG 7 SYSTEM OF NETWORKS

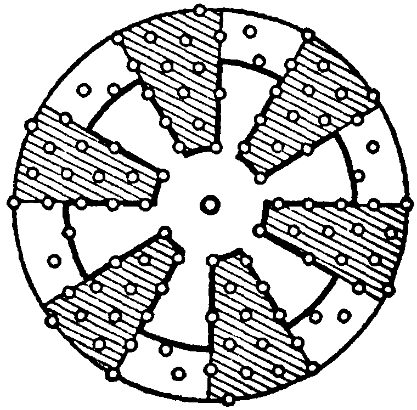


FIG. 8 COGWHEEL

greatest number of locations coincide, and a maximum of purchases can be made locally, (2) sums of minimum distances between industrial locations are least, and consequently shipments, transport costs and highways are minimized, (3) a very deep price funnel around the metropolis is surrounded by a ring of quite deep funnels around regional centers, and in between are rings of rings of less deep funnels.

These results have two very important consequences for traditional theory.[5] First, it is clear that the notion of an economic region is derivable and not primary. International trade theory can now explain rather than assume local cost differences on a homogeneous globe. Second, price funnels break up the landscape so completely as to make meaningless the concept of local price levels; no simple deductions can be made therefore about comparative advantage, migration of factors, or purchasing power parity.

Interregional equilibrium. When uniform natural endowments are assumed,

[5] Strangely enough, nothing in economic history or economic geography is invalidated This is because Lösch's main results have abstracted completely from historical and geographical accidents.

men, goods, and places are mutually determined. Every worker carries with him his individual demands. Every good requires certain inputs and a market area of a certain size. Every location, by its prices and rents, attracts or repels industries and dictates to men how they will spend their incomes.

Other things being equal, the following questions can be answered, one at a time, by means of marginal analysis: (1) What does a given person produce? (2) Who works at the production of a given good? (3) Where does a given person reside? (4) Who lives in a certain locality? (5) What does a given locality produce? (6) Where is a given good produced? That all six answers can be determined simultaneously is no surprise to the economist. Demands, freight costs, balance equations and marginal conditions are just enough to determine a solution.

How is this equilibrium restored if disturbed? In the short run, prices change and goods are transferred. Long-run disturbances lead to change of jobs or migration of industries. In fact all six relations play a part according to their price, time and space elasticities.

Price waves. Lösch devotes much space[6] to short-run disturbances and the transfer problem. I summarize this here only to present one last main idea, that of price waves.

Suppose a foreign firm suddenly orders from Paris 1,000 marks' worth of shoes instead of buying them, as it had formerly, in Berlin. In Paris, the price of shoes will rise; their market area will shrink but hides and nails will have to be bought farther afield. Workers will be attracted from other industries, and rents will rise. Neighboring shoe factories faced with shortage of materials and labor will raise the price of their shoes and bid up hides in their own supply areas. Paris will become the focus of inflationary price waves that ever expand in area, but ever diminish in intensity. This is so because the impact is divided among more and more establishments and other kinds of goods. Berlin would be the focus of deflationary waves.

Waves diminish because they divide. Their total volume, however, remains constant, unless, sooner or later, *compensatory absorption* occurs. To illustrate, Luxembourg with its new income may want to buy precisely what Leipzig had to give up.[7] This will wipe out the wave, not just divide and divert it. Compensatory transfer of goods may occur anywhere, in the Saar, on the Rhine, or in Mongolia. It does not have to take place on the Franco-German border.

Lösch's analysis uses tools of traditional economics, like maximization, pure competition, partial equilibrium, and simultaneous equilibrium. Conceptual analogies are less obvious.

The downward sloping demand of Figure 1 is analogous to that of imperfect competition. Localization of production corresponds to product differentiation. Space is to agriculture as time is to capital theory, an essential new ingredient.

[6] Pages 265-304.

[7] Compensatory absorption may occur on the major arc of the great circle through Paris and Berlin, say with Bordeaux absorbing what Königsberg had to give up, or it may occur off the great circle entirely.

As the Walrasian system determines relative and not absolute prices, so in Lösch the metropolis itself can be anywhere. The flattening of price waves is deceptively like the dying out of the multiplier. Compensatory transfer is a little like the Pigou effect.

Ideas with no analogues in ordinary economics, like the discontinuity of hexagon sizes (Table I), and the rotation of hexagonal networks (Figure 8) I find very rare. The persistence of rent differences in spite of homogeneous endowments is *not* due to any novel assumption.

That familiar concepts should generate startling results more than any other thing attests to the genius of August Lösch.

COMMUNICATIONS

On Underwriting Consumption and Employment

The purpose of this note is to amplify one aspect of my earlier proposal for underwriting full employment in the United States[1]—the part having to do with techniques for boosting consumption when it would otherwise fall short of the target. It is probable that the subject of full employment will claim the spotlight again when and if the world situation permits major reductions in armament expenditures, and it is at least possible that a policy of assured full employment in this country, if we had such a policy now, would help to hasten that day.

The question of feasibility depends, I have argued, on whether or not aggregate consumer spending is underwritten in addition to aggregate employment as such. Without that feature, a policy of guaranteed full employment could involve the government is so large a degree of direct responsibility for the creation of jobs—such as expansion of public works, and perhaps wholesale subsidies to, and/or control over, private production—as to compromise the essentials of our private-enterprise system. Because of that risk, such a policy (as contrasted with contracyclical policy in a more limited sense) is not likely to be voted in the United States in the foreseeable future. That risk disappears if aggregate consumer spending, too, is underwritten and maintained at a proper level, one high enough to keep reliance on supplementary public works within reasonable bounds.[2] The risk of an unbalanced

[1] See my "The Underwriting Approach to Full Employment: A Further Explanation," *Rev. Econ. Stat.*, Aug. 1949, XXXI, 182-92. Also my "The Underwriting of Aggregate Consumer Spending as a Pillar of Full-Employment Policy," *Am. Econ. Rev.*, Mar. 1944, XXXIV, 21-55; other papers collected in *Full Employment and Free Enterprise* (Washington, 1947); and "Employment the Key," *Christian Science Monitor*, July 23, 1949, mag. sec., pp. 2, 12.

[2] See "The Underwriting Approach . . . ," *op. cit.*, pp. 184-85, for my theory of the "correct" level of aggregate consumer spending. Briefly, (1), estimated full-employment GNP, minus (2), the sum of (2a) expected government purchases of goods and services, including all public works approved "for their own sake," (2b) expected gross private domestic investment (probably, as a general rule, the anticipated cyclical-average level), and (2c) expected net foreign investment, equals (3) the level at which personal consumption expenditures should be underwritten. Thus one may advocate, as I personally do, rather generous regular appropriations for public works, but the amount included in (2a), and hence reflected in (3), depends on the will of Congress. A foreign-trade balance, plus or minus, similarly affects, and is accommodated in, (3) because it registers in (2c) and, where due to foreign aid, etc., in (2a). Actually my proposal calls for setting, not a single target figure for aggregate personal consumption, but a range between a guaranteed floor and a guaranteed ceiling, the leeway allowed being possibly of the order of 2 per cent. A summary statement on how minimum and maximum levels both of aggregate consumption and of aggregate employment would be likely to be established and administered in practice, *i.e.*, the respective roles of Congress and the Executive and the requisite amendments to the Employment Act of 1946, appears in "Employment the Key," *op. cit.*; see also *Full Employment and Free Enterprise*, *op. cit.*, pp. 163-70.

budget remains, but this—a corollary of the danger of oversaving itself—is not, as the other risk is, one that our system of private enterprise cannot bear.

I have elsewhere suggested a number of alternative procedures for enlarging consumers' incomes directly when personal consumption expenditures would otherwise—even at a full-employment level of income payments—fall below the underwritten level.[3] For some time I was inclined to stress tax reductions or offsets. Here I wish to bring into consideration a different method, involving the use of what might be called Consumer Sales Premiums (CSP for short). This method would provide not only additional purchasing power but an actual inducement to spend. Where an income-tax rebate, for example, would not favor consumer spending relative to consumer saving, but rather would tend to raise the level of both, CSP would be distributed only in connection with consumer spending as such and hence would establish a direct incentive to spend more, both out of normal income and out of the premiums when cashed. Thus the target level of consumer spending would be reached at smaller cost to the government.

Certain other general characteristics of the CSP method may also be briefly noted here. It would not noticeably reduce anyone's incentive to work—a charge sometimes loosely leveled against consumer transfer payment schemes in general but actually valid in special cases only. It would be perfectly flexible as to the amount of "lift" to consumer income it could provide. And it would be reversible into a special sales tax,[4] with a minimum of difficulty or misunderstanding, in the event the problem shifted to one of avoiding an inflationary rise of consumer spending above its guaranteed ceiling.

CSP would take the form of small coupons or stamps, in convenient denominations, which would be used as follows: (1) The Treasury would distribute them to banks and designated post offices throughout the country. (2) Banks and post offices would pass them along, when authorized by the responsible agency in Washington, to "retailers"—stores, service establishments, independent professional practitioners such as doctors—in ratio to their certified

[3] See "The Underwriting Approach . . . ," *op. cit.*, pp 187-88 It is important to note that such measures—indeed, all *compensatory* measures under this plan, whether they be (a) such measures, taken in relation to current rates of consumer spending, to expand or contract consumer income directly, or (b) measures, taken in relation to current levels of employment, to expand or contract public works (and, incidentally, hold income payments at the full-employment level)—are viewed as *supplementing and in no sense substituting for basic or long-run policies*, a primary function of which is to make compensatory measures less necessary. The more that basic fiscal and other measures (high wages, a tax system that is progressive but encourages risk-taking, prevention of abuses of monopoly power, etc.) can do to strengthen production incentives and broaden the distribution of purchasing power, the better.

[4] I am opposed to giving sales taxes, with their regressive character, any disproportionate emphasis in our tax system. However, if a special sales tax were linked with CSP in a two-way compensatory mechanism of the type here considered, the usual objection need hardly apply. The effect would be as progressive during periods when it was necessary to boost purchasing power as it would be regressive when necessary to hold purchasing power down; or more so, assuming sales tax exemptions for necessities.

current volume of consumer business.[5] (3) During periods declared to be "pay out" periods, retailers would give them to individual consumers as premiums on their purchases (value of purchase, times authorized percentage, figured to the nearest penny). (4) The individual consumer would redeem his CSP for cash at his bank or post office before the expiration date marked on the stamp's face. (5) Banks and the U.S. Post Office Department would return the CSP in bulk lots to the Treasury and would receive face value plus suitable compensation for their services as agents.

The administrative problems connected with such a scheme do not appear unduly formidable. The burden on retailers would be roughly like that of a sales tax—slightly more for bills mailed, since these upon payment would require a return receipt transmitting CSP. While there might be a number of CSP agents in a community, each retailer would normally have to choose one source of supply, and all lists of applicants would be cross-checked to prevent duplication. Each consumer would likewise normally deal with a single bank or post office selected by him. As a convenience and further precaution he probably would have a blank book issued to him, identified as his, to the pages of which his CSP would have to be affixed to be eligible for redemption in cash.

A numerical example will illustrate the effect on the economy as a whole. Assume aggregate consumer spending in year *X* underwritten at $300 billion, with the top limit set at $306 billion. Ignoring here the seasonal factor in sales, at least $75 billion should then be spent each quarter, or $25 billion each month. Assume that, after six weeks, the preliminary forescast for the first quarter showed only $72 billion. The responsible agency might then authorize CSP to be issued on all retail sales at a 10 per cent rate during months 3, 4 and 5. If monthly rates of consumer spending rose from $24 billion in months 1 and 2 to $27.3 billion in months 3, 4 and 5 (let us suppose that the inducement of obtaining CSP raised "ordinary" spending to $25 billion; add $2.5 billion CSP converted to cash less $200 million of extra saving from this extra cash), this would bring the five-month total to $129.9 billion, as against a target minimum of $125 billion, and the responsible agency might order termination of CSP payments at that point. The premiums might have to be issued again, at the same or a different percentage rate, later in the year. Or, if conditions changed markedly and total consumer spending for the year threatened to exceed the $306 billion limit, the responsible agency would bring into play the special sales tax or other agreed device for curbing a spending excess.

John H. G. Pierson*

[5] Purchases for business account would sometimes masquerade as consumer purchases. However, "leakage" in either a real or a statistical sense (in reduced leverage value for the economy, or in excess of transactions included for CSP over transactions included in the personal consumption expenditures aggregate) should prove relatively minor.

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The Economics of *Scrabble*

This study investigates the applicability of certain general economic principles to SCRABBLE, a game assumed to be too well known to require description. The study is not an exercise in the theory of games; it is diametrically opposite to it. The theory of games takes its cue from the rather distressing proposition that the road to a proper theory of economic behavior passes through the study of the simplest of games, such as "Matching Pennies." The present paper radiates the much more self-satisfying philosophy that games, even such sophisticated games as SCRABBLE, can learn a lot from existing economics.[1]

In its relation to its subject, the study may well be compared to the economics of the firm. Mastery of this branch of economics is obviously not indispensable to satisfactory business management. But it helps the economist to understand what successful managers do; and it also helps managers to understand what they have usually been trying to do all along, and to do it better. Very much the same holds for the economics of SCRABBLE. Its mastery is not a substitute for the memorization[2] of *Webster's Unabridged;* but it helps.[3]

While some of the expositional devices used are borrowed from mathematics, the study is essentially economic in nature. Economics provides the analytical, as distinguished from the expositional, tools.

1. *The Proper Thing to Maximize*

One of the achievements of economics is to select the proper thing to maximize in each situation. As Samuelson has put it: "The study of maximizing behavior affords a unified approach to wide areas of current and historical economic thought."[4] Some businessmen might be inclined to maximize turnover; but clearly the wise thing is to maximize profit (or even better profit over time, suitably discounted). Some people might aim for maximum income; they should realize that what they really want is the optimum balance between income and leisure. While others might be satisfied to maximize some gross concept, the economist is always on the lookout for the costs and hence for the proper net concept to maximize.

In SCRABBLE, there is a clear gross target: to get as many points as possible. That is the objective which the inexperienced player tries to achieve *in each move.* Is there a cost?

2. *Alternative Use*

Economics points the way directly to what the "cost" element must be: alternative use. When a letter is used to make one particular word there is a sacrifice of the score that might have been obtained with the same letter in

[1] As in almost any use of tools in a new field, some refinement of the tools is found as a byproduct. See footnote 6.

[2] *Webster's New International Dictionary,* 2nd ed., unabridged, p. 1534.

[3] There is also a (relatively minor) strategy element in SCRABBLE, with which this paper does not deal.

[4] P. A. Samuelson, *Foundations of Economic Analysis* (Cambridge, 1947), p. 23.

another word. This is the key to the calculation of economic costs, which involves three steps.

Step 1. According to the information provided by the manufacturer, the total score of the game may be from 500 to 700 or more, or say, on the average, about 600. This is about three times the aggregate face value of all letters—187 for 100 letters, whose individual face values run from 1 (A, E, I, O, U, L, N, R, S, T) to 10 (Q and Z). This ratio, 3, we call the *multiplier* (M). A somewhat higher multiplier would be indicated for superior players.

Step 2. Ultimate value in the economic sense should be based on relative scarcity. We observe that the frequency of the letters in the game—from 12 E's to one each for J, K, Q, X, and Z, appears to be approximately in proportion to their frequency in the universe of the dictionary. It follows that their marginal usability to make words should be about the same, and hence their marginal utility, in terms of score value, should be proportional to their face value.

Step 3. Since (a) the total score value of all letters equals the multiplier times their aggregate face value and (b) their individual score values are proportional to their individual face values, it follows that the economic cost of an individual letter is found as the multiplier times the face value of that letter. With a multiplier of 3, for instance, a letter with a face value of 4, like H, must be reckoned as costing 12 if used in a particular score.

3. *Special Accounting Prices*

While decentralized cost calculations based on market prices may be assumed to perform tolerably well as an allocative device for most purposes, it is recognized in economics that sometimes prices other than those prevailing in the market, "accounting prices," have to be used to obtain a proper social optimum.[5] This principle has an important corollary in SCRABBLE. In the following instances there is ground for the use of special accounting prices, instead of face values, in computing costs. (a) To some extent the frequency of SCRABBLE letters may deviate from that in the real world, due for instance to indivisibilities (one feels that half a Q would be ample, and economists would like to have a chance to show off their training if they could once in a while get 2 K's to make "kinked"). (b) There are also letters that are particularly useful, like the S for making plurals. (c) There is, lastly, the particular skill of the player. To a player who has just memorized all the Z-words of the dictionary a Z has obviously a higher opportunity value than to one less erudite, and this should be reflected in his individual cost calculations regarding the use of the Z.[6]

[5] J. Tinbergen, "The Relevance of Theoretical Criteria in the Selection of Investment Plans," Conference on *Investment Criteria for Economic Growth*, mimeo. (Cambridge, 1954). Also for a particular application to the exchange rate: H. B. Chenery, "The Application of Investment Criteria," *Quart. Jour. Econ.*, Feb. 1953, LXVII, p. 76-96.

[6] This points to a necessary elaboration of Schumpeter's theory of the entrepreneur. His 19th century entrepreneur was apparently satisfied to pursue any reasonably handsome profit by introducing some new combination while buying factors of production on the

4. *Replacement Letters*

The analysis of cost has proceeded so far on the assumption that a letter used has to be calculated fully as a cost item. But, under the Rules, each letter used is replaced by another one. Since each replacement letter is drawn face down, its value cannot be known: the theory has to be based on its *probable* value being the *average* value of all letters,[7] *i.e.* 187 ÷ 100 or, after rounding, 2. Allowing for replacement we find that a letter used has a *net* cost of multiplier × (face value[8] − 2).

By an involved process of reasoning it can be shown that no allowance is necessary for the fact that by drawing, say, x letters from those still remaining, a player reduces the number of letters that he will be able to draw in the future. At first sight it would seem that he does reduce his ultimate supply of letters by a number which might be approximated as $\frac{x}{n}$, n being the number of players. This would set him back in score by $\frac{2Mx}{n}$, 2 being the rounded estimated probability value of each letter foregone. But further consideration leads to the conclusion that not only this player, but *every* player, will lose $\frac{x}{n}$ letters as a result; and assuming, as a first approximation, that all play equally well, *i.e.*, that they operate with the same M, each will lose $\frac{2Mx}{n}$ in score. If then our player's objective is to win, rather than to amass the largest absolute number of points, any adjustment that applies equally to all players may be disregarded. We should note, in passing, the important finding that, since n will not appear in our formula, the economically best way of playing SCRABBLE is independent of the number of players.

5. *The Formula*

Summarizing the above we find that a player should maximize at each move his profit P, computed as follows:

$$P = S - M \sum_{i=1}^{i=x} (v_i' - 2), \qquad (1)$$

basis of their cost (= opportunity value when used in the circular flow) But the man who has a variety of tempting entrepreneurial possibilities among which his staff must choose must obviously calculate as part of the cost of any one of them the profit to be made in a "normal" entrepreneurial exercise As Mr. Wolfson (to quote a 20th century entrepreneur rather than an economist) stated to *Life* about his only business mistake, making several hundred thousand dollars in movies: "But we took a couple years to do it and that's tying up too much time and capital for that size result." (*Life*, Nov 22, 1954, p. 179).

[7] Making no adjustment for any possible difference from the average of the letters that have already been drawn earlier in the game.

[8] Adjusted face value where appropriate.

where: S is the score to be made in the move
M is the multiplier (about 3), and
v_i' is the (adjusted) face value of any letter i ($i = 1, 2, \ldots x$) used.

6. *Practical Application*

A. *Choice between alternative simultaneous possibilities.* Formula (1) is easily applied in practice to decide which of various alternative possibilities yields the highest P. It takes little time or skill to subtract 2 from the face value of each letter to be used, to add up the results and to multiply by 3.

Since our formula, through use of the cost principle, allows for the value of future use, it also indicates whether, where there is any choice, an additional letter should be used, or whether it is more profitable to save it for later. For this purpose, however, the formula can be considerably simplified.

B. *Intertemporal allocation.* For this purpose we transform the formula into an expression for the marginal profit attributable to the use of an individual letter (P'), as follows:[9]

$$P' = kv - 3(v - 2) \tag{2}$$

where $k = 1, 2, 3$, depending on whether the score made with the letter is single, double or triple. This reduces to:

$$\left.\begin{array}{ll} P' = 6 - 2v & k = 1 \\ P' = 6 - v & k = 2 \\ P' = 6 & k = 3 \end{array}\right\} \tag{3}$$

From this follow a number of rules:

Rule I. Letters with face values of 1 and 2 *should*, and letters with face value of 3 *may*, be used whenever there is an opportunity. Even when they score singly, they will yield a nonnegative profit.

Rule II. Letters with face values of 4 and 5 should not be used unless they score at least double—(but do not wait for triples!)

Rule III. Letters with face values of 8 and 10 should be kept for triple scores, but with two very important qualifications: (a) Only a small discount for their adjusted value (v') below v is necessary to justify, *i.e.*, to compel, use of these letters if only a double score is the best that can be made.[10] (b) No allowance has been made so far for the fact that the game is in practice played with a finite number of letters, and that a penalty attaches to remaining stuck with a letter at the end of the game. For these high-value letters with limited usefulness a correction for this is needed (for other letters its

[9] Assuming $v = v'$ *i.e.*, face value equals accounting value

[10] The required discount is derived from (2), taking $k = 2$ and stipulating $P > 0$:

$$2v - 3v' + 6 > 0$$
$$v < 2/3v + 2$$
$$\text{For } v = 8,\ v' < 7.33$$
$$v = 10,\ v^1 < 8.67$$

effect would be negligible). It consists in subtracting from the cost of using the letter now an estimate of the probable loss at the end of the game due to the impossibility to use the letter in the future. The amount involved is $q^m \cdot v$, where q is the probability that one cannot use that letter in one move, and m the estimated number of moves the player expects to have ahead of him. If, for instance one can use a Z ($v = 10$) only once every five moves ($q_z = .8$) and one expects to have only four more moves left, the correction would be $.8^4 \times 10 = 4.1$. This would make P' just positive for $k = 2$.

These Rules are by no means self-evident. Thus Rule II is violated in one of the few examples which the manufacturer provides with each set. In this example an F ($v = 4$) is used, without necessity, to yield only a single marginal score.

Despite the theoretical complications involved in the derivation of these Rules, it will be found that they can easily be followed in practice, even by beginners.

J. J. Polak

Dollar Pooling in the Sterling Area: Comment

In a recent article, "Dollar Pooling in the Sterling Area,"[1] Kenneth M. Wright has made an excellent contribution to the understanding of one important aspect of the sterling area. There are several comments, however, that might usefully be made.

Wright states that "one major qualification" is necessary to the tables he presents on the sterling countries' yearly positions with respect to the dollar pool. This qualification is that because of the intrasterling-area transactions in "dollar-saving exports" the country figures, even if perfect,[2] would not show the "true contribution" which each country has made to the problem of the entire sterling area's dollar shortage.[3]

I think that there is a more important qualification that needs to be made. The contribution a sterling-area country is making towards the solution of the entire sterling area's dollar shortage must be measured not only by its bilateral position vis-à-vis the dollar area but by its global balance of payments. This latter provides a measure of the degree to which the country makes necessary a drain on the external resources of the area or contributes to building up the external resources of the area. Note, for example, that in

[1] *Am. Econ. Rev.*, Sept. 1954, XLIV, 557-76.

[2] Wright mentions that the dollar accounts of the sterling-area countries other than the United Kingdom are underestimated when these countries do not take account of dollar goods received through intermediaries in the United Kingdom. The share of the United Kingdom is also exaggerated because: (a) The dollar cost and proceeds of goods that undergo processing in the United Kingdom and that enter into intrasterling-area trade are allocated to the United Kingdom in the U.K. balance of payments accounts; (b) The whole of the British oil companies' production expenditure in dollars is allocated to the United Kingdom in the British accounts though much of the output is consumed in the rest of the sterling area; (c) Dollar investment in the rest of the sterling area by American companies often appears in the balance-of-payments statements of those countries (*e.g.*, Southern Rhodesia) as the receipt of sterling.

[3] Wright, *op. cit.*, p. 573.

Wright's Table I, the biggest single drain on the central reserves over the period 1946-52 was "Transactions with nondollar areas on whole sterling-area account." These were gold and dollar payments made necessary by the position of the whole sterling area vis-à-vis a particular country or area which converted into dollars or gold only a part of its sterling receipts, *e.g.*, the European Payments Union. During this period such gold and dollar payments were made at one time or another to most of the nondollar nonsterling world.

The January 1954 Commonwealth Finance Ministers' conference emphasized in its final communiqué that while the sterling-area countries should maintain their efforts to achieve a dollar surplus directly, it was just as important to earn a substantial surplus in other nonsterling currencies.[4]

With the expansion of the transferable sterling account system to almost the whole of the nondollar nonsterling world in March 1954 there can be seen even more clearly the important influence the nondollar part of the sterling-area countries' balances of payments exerts on the dollar position of the sterling area. If the sterling-area countries make available too much sterling to the rest of the world, the central dollar reserves are sure to suffer. Transferable sterling becomes cheap in New York and commodity shunting begins:

> . . . a sterling commodity is sold by a Continental merchant to the United States. He wins the business on competition with a British merchant because he uses a cheaper type of sterling and can therefore offer a lower price. The dollars he gains are lost to the sterling area; they are reconverted into sterling in the transferable market.[5]

Also,

> . . . there is no difficulty about the import into this country [the United Kingdom] of many dollar commodities which are then reexported to the continent against payment in sterling.[6]

The sterling part of the balance-of-payments accounts of a sterling-area country is also important. An obvious example: if India has a balance with the nonsterling world but a deficit with the United Kingdom financed by drawing down its sterling balances, it will absorb British products which might have been sold for dollars.

I think that the foregoing should be sufficient to make the point that in assessing the contribution made by a sterling-area country to the dollar position of the whole area, it is necessary to consider not only its dollar accounts but its global balance of payments.

On the other hand, I do not feel that the principle cited by Wright (p. 573) that "exports to sterling countries which save dollars for the common reserves

[4] The need for improving the global balance of payments has been repeatedly emphasized by the Commonwealth Finance Ministers' conferences. The December 1952 conference, for example, stated: "An adequate and stable external balance must be a first objective for all Governments."

[5] "Shunting Backwards," *The Economist*, Feb. 12, 1955, CLXXIV, 557-8

[6] *Loc. cit.*

are as valuable as exports which earn dollars" has much meaning in this type of analysis.[7] It is perfectly true that on a few occasions countries in the sterling area have tended to advance this as a kind of justification of their position when they were showing heavy dollar deficits. The virtue of this "principle"—and its fundamental defect—is that almost everything can be plausibly cited as being a dollar-saving export. When Australia provides wheat to England and England provides machinery to Australia both can feel a glow of satisfaction for thus saving dollars for the common reserves and at the same time continue to be net drawers of dollars from the dollar pool.

The dollar accounts of a sterling-area country and its net position vis-à-vis the dollar pool can be more or less ascertained. Similarly its global balance of payments can be ascertained and these two together provide a basis for a judgment of the contribution that each member is making to the solution of the area's dollar problem. And, of course, as the world currencies became more and more convertible *de facto* the latter element becomes more and more important. There is no need for any attempt to assess the purely hypothetical dollar-saving elements in intrasterling-area trade.

On the whole, although Wright's discussion of the position of the outer sterling-area countries is good, a few slips have occurred in treating the position of the Colonial territories.[8]

A fairly serious error occurs in two places: on page 569, he says, the dollar contribution of the colonies ". . . is slightly more than the rise in sterling balances held by the colonies since 1946, and in effect, represents a rather curious capital movement from the colonies to the United Kingdom in the form of dollar exchange." On page 574, he says, "Lacking autonomy in their own dollar-import policies,[9] they [the colonies] have contributed almost $2 billion to the pool in 1946-52 and have accumulated sterling balances of roughly equal size during the same period. The colonies have thus been exporting capital to the United Kingdom in the form of dollar exchange." This point is a good example of a *non sequitur*. The fact that colonial sterling balances have increased does not necessarily mean that the colonies as a bloc have been exporters of this amount of capital to the United Kingdom (though several of the colonies have exported capital to the United Kingdom during this period). It could even mean that the United Kingdom has made more capital available to the colonies as a whole than the colonies could absorb.[10]

[7] One possible exception—and it would apply to only a few cases—would be where a sterling-area country in choosing between two new investments, each yielding the same return, would choose the one that would produce a replacement for dollar goods.

[8] For example, he says on page 561, "Colonial dollar earnings are surrendered to the local exchange controls and transferred to the Bank of England or its authorized dealers." The typical case, in fact, is rather that of a colony whose foreign trade is handled by banks with head offices in London or by trading or producing companies with headquarters in London. The dollars earned by exports to the dollar area never see the colony but stay in London. The local producers get the money they want—local currency or sterling balances.

[9] It is not correct to say that the colonies lack autonomy in their own dollar import policies. It would be more accurate to say that the colonies are more amenable to persuasion on this than are the fully independent members of the Commonwealth.

[10] *Cf.*, movement in European gold and dollar reserves during Marshall Plan period.

To illustrate my point by a particularly fortunate example: in 1953, the colonies, excluding Hong Kong, had a deficit on current account of £15 million,[11] yet colonial sterling balances, excluding Hong Kong, went up by £57 million.

There are some corrections in Table III on page 571 that Wolfgang Weigel has called to my attention: Table III shows a gold and dollar contribution to the central reserves by Australia in 1950 of $24 million. It should be $54 million. The difference is equal to the amount of gold sales to the United Kingdom which were probably not taken into account. Pakistan's drawings are shown as $11 million too high in 1951, and too low in 1952. This is probably because the $11 million gold purchase was ascribed to 1951 while it actually occurred in 1952. The same is true of the gold purchase of $11 million by Ceylon. It occurred in 1951 rather than 1950. In 1952, the figure for Southern Rhodesia is $15 million too low, perhaps by reason of the omission of gold sales of this amount to the United Kingdom. Footnote *ii* of the table states that statistics were not available for several countries, among these Iceland and Iraq: regional balance-of-payments data are available for Iceland in the *Balance of Payments Yearbook* of the International Monetary Fund. Published figures are also available for Iraq for the years 1951 and 1952 in the *Quarterly Bulletin of the National Bank of Iraq*, Nos. 3 and 7.

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[11] Colonial Office, *The Colonial Territories 1953-54*, Cmd. 9169 (London, 1954), p. 53.

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Dollar Pooling in the Sterling Area: Comment

K. M. Wright's article, "Dollar Pooling in the Sterling Area" in the September 1954 number of this *Review* is a useful and interesting account of the policy declarations and statistical results of the "dollar pool" which has been functioning in the sterling area. However, his interpretation of the position of the British colonies in the pool's operations is apt to be misleading because it ignores certain important conditions that underlie the financial results tabulated in the Balance of Payments White Paper. I refer in particular to his statement, "United Kingdom colonies were of great importance in bolstering the dollar reserves between 1946 and 1952. Their contribution is slightly more than the rise in sterling balances held by the colonies since 1946, and in effect, represents a rather curious capital movement from the colonies to the United Kingdom in the form of dollar exchange" (p. 569), which is later amplified, "For the colonies, however, dollar pooling has had serious drawbacks. Lacking autonomy in their own dollar import policies, they have contributed almost $2 billion to the pool in 1946-52 and have accumulated sterling balances of roughly equal size during the same period. The colonies have thus been exporting capital to the United Kingdom in the form of dollar exchange" (p. 574).

As Mr. Wright also states, however, not all the colonies have been net contributors to the dollar pool. Some have run substantial deficits, and many have not had significant balances either way. Clearly, therefore, they have

not all suffered hardship of the same kind or for the same cause. Nor has their lack of autonomy had a uniform effect upon their dollar expenditures. This lack of "complete autonomy" in foreign exchange policy is a logical consequence of the colonies' general monetary relationship to London, and in comparing their position to that of the "independent members of the sterling area" it should be remembered that the colonies are in practice overseas parts of the United Kingdom monetary system, and have no responsibility for maintaining foreign exchange reserves or taking any other measures that would affect the value of their own currencies. Moreover, they did not have rationing and tax controls on consumption in the postwar period to the same extent the United Kingdom did, and hence import licensing was practically the only method of controlling the demands (reflecting war-inflated incomes) for goods and currencies of which there was a global scarcity. The colonies have been notable beneficiaries of the postwar rise in raw material prices, and this has played an important part in increasing the level of international monetary reserves which it has been necessary for London as the banker for the sterling area to hold.

But while the colonies had to pursue the same fundamental policy of exchange control as the United Kingdom, every colony had its own government department for administering its import and currency regulations with some discretion as to the actual goods that were admitted or excluded. And these separate administrative methods led to a wide variation in local control practices. Underlying the major differences in dollar expenditure were of course the differing needs between colonies for essential imports. The West Indies, for instances, had to have flour from Canada, and Jamaica built tourist hotels with United States materials, but in the West African territories such imports were not of the same urgency. There may be room for doubt as to whether the operations of the local controllers had ideal results in every colony, but their existence did mean that the total dollar expenditure of each colony as well as the particular goods imported depended in some degree upon the case the local authorities presented to London and the decisions they made in issuing permits to applicants.

The central error in Wright's argument, however, is his insistence that the automatic consequence of contributions to the dollar pool was a corresponding export of capital by the colonies to the United Kingdom. For evidence of this relationship he seems to rely on the statistics of rising colonial "sterling balances" since 1946, although it is easy to find a superficial defect in this reasoning in the fact that colonies with dollar deficits as well as those with dollar surpluses have been increasing their sterling balances. In reality the two processes of regulating dollar expenditures and acquiring London assets are quite distinct. The colonial recipients of dollar exchange pay it into their bank and receive an equivalent amount of sterling which they are free to spend for any purpose except prohibited imports. The fate of the dollars contributed to the pool is quite independent of the use ultimately made of their sterling equivalent. And independent also of contributions to or drawings from the pool is the accumulation of the government and banking assets known as sterling balances. These are chiefly the consequence of colonial

government methods of finance which involve holding liquid and invested funds in London, and they are related to the system of internal taxation, not to foreign exchange control. They derive from taxes raised in each colony, from deposits in savings and commercial banks, and from such special items as the reserve funds of the postwar Commodity Marketing Boards. These colonial sterling balances have nothing in common with the similarly classified wartime accumulations of some other parts of the sterling area, and their increase is a reflection of general economic conditions since the war. Colonial residents who receive sterling in exchange for dollars are free to invest it in other parts of the sterling area, and most of this investment goes through London, but the assets of private investors are not shown in the official statistics of sterling balances to which Wright refers. That is to say, these statistics do not include the whole of the capital movement from the colonies to London. They do, however, aim at showing total dollar transactions. That the *ex post* record on this basis should make the colonies appear to be deprived of dollars—and capital—to exactly the same extent that they acquired sterling balances seems to be one of those results that Hollywood calls entirely coincidental.

If we want to attribute monetary implications to the statistics of colonial trade it is important to remember that the recorded import-export figures for each colony do not show with exactitude either the currency receipts available to people in the colony or the total claims on dollar sources represented by its imports. This discrepancy arises for two reasons. One is that a part of the proceeds of certain exports, *e.g.*, rubber, tin, copper, lead and zinc, tea, sugar, etc., go to company funds and investors in the United Kingdom where the producing concerns are owned and controlled, and hence the total value of exports is not distributed to people in the colonies for spending on goods from any source. The colonies showing a significant dollar surplus are those where there is a substantial United Kingdom investment in export production. The other reason is that the imports of most colonies include a high proportion of manufactured goods from the United Kingdom which incorporate part of the United Kingdom's own dollar imports of raw materials and components, particularly cotton, wheat, tobacco, paper and chemicals. And in this connection it must be recalled that consumption in general was not so restricted in the colonies in the postwar period as it was in England, and people in the former could buy all they could afford from sterling sources, even when people in the United Kingdom could not.

In claiming further (p. 574) that "broadly speaking, the United Kingdom has been able to maintain its capital exports to the independent sterling countries only by passing on to them much of the dollar aid received during the early postwar years, and by importing capital from the colonial sterling area in more recent years," Wright seems to ignore the steady flow of both private and public capital to the colonies since the war. Investment in many large-scale industries has been increased. For instance, in oil, bauxite, copper and base metals, gold, diamonds, sugar and sisal, and also in light and power installations, in harbors, docks, roads and railways, and a variety of minor industries. Several colonial governments have raised loans in London, and

some municipal issues have been floated there for the first time. In addition to these market transactions there have been two special organizations, the Overseas Food Corporation and the Colonial Development Corporation, established for making investments with Treasury funds, and the colonies have made regular drawings from the development and welfare funds voted by Parliament. Also, there are always emergencies and disasters, such as floods, famines and hurricanes, for which *ex gratia* payments are made by the United Kingdom. Detailed information on these matters is given in the Secretary of State's annual report to Parliament on the Colonial Territories.

In the postwar decade a vigorous policy of economic development has been pursued in most parts of the Commonwealth, and dollar drawings from the pool have in large part been determined by the import requirements of this policy. For various reasons, not all monetary, the colonies have obtained most of their capital imports from the United Kingdom, but this fact alone is not evidence that their development plans and projects have been handicapped by lack of dollars. It is an error of still wider implications to think that the United Kingdom depends for maintaining its international economic position upon the capital it arbitrarily "imports" from the colonies. This is to misrepresent not only the monetary position of the colonies but also the whole problem of sterling.

IDA GREAVES*

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Reply

Although the points raised in the comments of Miss Greaves and Mr. Kamarck are interrelated, I will discuss separately each of the major questions raised by them.

1. Miss Greaves asserts that colonial sterling balances "derive from taxes raised in each colony, from deposits in savings and commercial banks, and from such special items as the reserve funds of the postwar Commodity Marketing Boards." Although sterling assets held by colonies may be classified in terms of ownership in this manner, this approach obscures the fact that sterling balances rise or fall primarily as a result of the balance of payments of the colonies. Whether net export proceeds are deposited in savings and commercial banks, or taxed by colonial governments, or kept as reserves by the marketing boards and price assistance funds does not matter in this context—colonial balances nevertheless arise largely from external transactions.

2. Sterling balances owned by the colonies are the financial counterpart of the real resources to which the colonies have a claim, but have released to others; instead of using these resources at home, the colonies have allowed others to use them. In this sense, the colonies are net exporters of capital when there is a rise in colonial sterling balances. When the colonies have a dollar surplus and contribute such dollars (as well as gold) to the dollar pool, the transaction may be considered as a release of claims over dollar goods and

therefore an export of capital in the form of dollar exchange; in exchange for dollar claims, sterling balances are increased. At the same time, of course, the colonies may be incurring deficits with nondollar countries and drawing down sterling balances by reason of such deficits, representing an import of capital in the sense outlined above. Taking both dollar and nondollar transactions together, the colonies could be either net exporters or net importers of capital vis-à-vis the rest of the world (and therefore increasing or decreasing sterling balances), depending upon the size and direction of the two types of transactions.

The only available statistics that use consistent definitions and coverage for the external colonial transactions are those for transactions with the dollar area (on current and capital account) and for the changes in colonial sterling balances, shown in Table I. These data reveal a parallel movement in

TABLE I.—COLONIAL EXTERNAL TRANSACTIONS
(in millions of pounds)

	Transactions with the Dollar Area	Change in Colonial Sterling Balances
1950[a]	+156	+172
1951	+174	+195
1952	+139	+104
1953	+101	+ 68
1954	+108	+124
1950–54	+678	+663

[a] Includes Northern Rhodesia, which is subsequently excluded from the balance-of-payments definition of "United Kingdom colonies."

Source. Cmd. 8976, *United Kingdom Balance of Payments, 1946 to 1953* (London: HMSO, 1953); Cmd. 9430, *United Kingdom Balance of Payments, 1946 to 1954*, No. 2 (London: HMSO, 1955).

the rise in colonial sterling balances and the colonial contributions to the dollar pool resulting from current and capital transactions with the dollar area (including gold sales to the United Kingdom). What is missing in these accounts is (a) colonial current accounts with the nondollar world,[1] and (b) colonial capital accounts with the nondollar world. Data which are not fully consistent with those of the table indicate that the colonies incurred rather sizable current-account deficits with other sterling-area countries; these deficits were probably offset in part by an inflow of financial capital from nondollar countries (mainly the United Kingdom). It would appear that nondollar colonial transactions on current and capital account largely washed each other out; consequently, the dollar contributions of the colonies may be

[1] Data on the colonial current accounts since 1950 are available in the Colonial Office reports on *The Colonial Territories*, published yearly, but comparison with data on colonial dollar transactions is prevented by differences in coverage. For example, Hong Kong is excluded from colonial current account statistics, while the Rhodesias are excluded from the definition of "United Kingdom colonies" in the United Kingdom balance-of-payments statistics on colonial dollar transactions and colonial sterling balances.

considered as primarily responsible for the increases in sterling balances over this period. The only other candidate for this role, suggested by Kamarck, is the flow of unabsorbed financial capital to the colonies from the nondollar world, but fragmentary data indicate that this factor is only a runner-up far behind in the competition. Although the changes in sterling balances and the transactions with the dollar pool obviously do not match up year by year and colony by colony, since a host of other factors comes into play, I still submit that it is valid to view the colonial dollar contributions both as exports of capital in the form of dollar exchange, and as a strategic factor in the postwar rise in colonial sterling balances.

3. Regarding the degree of autonomy over import policies which the colonies possess, Miss Greaves declares that every colony had "some discretion as to the actual goods that were admitted or excluded," and that "the total dollar expenditures of each colony as well as the particular goods imported depended in some degree upon the case the local authorities presented to London. . . ." But this description does not tell us how far such autonomy went in practice. Available statistics reveal that colonial dollar imports did not in fact keep pace with those of other members of the sterling pool during the greater part of the postwar period, as may be seen from Table II.

TABLE II.—STERLING AREA DOLLAR IMPORTS

	Millions of U.S. Dollars			1948 Value = 100		
	United Kingdom	U.K Colonies	Other Sterling Area*	United Kingdom	U.K Colonies	Other Sterling Area*
1948	1,634	310	875	100	100	100
1949	1,606	220	805	98	71	92
1950	1,206	135	590	74	44	67
1951	2,055	215	1,100	126	69	126
1952	1,668	195	1,165	102	63	133

* Excluding South Africa, which did not coordinate its dollar import policies with the rest of the sterling area.

Source: Cmd. 8976, *United Kingdom Balance of Payments, 1946 to 1953* (London: HMSO, 1953). The 1948 base is appropriate because sterling area dollar import restrictions had been universally tightened following the 1947 convertibility crisis

4. As to whether the international position of sterling has been misrepresented by an emphasis on rising colonial sterling balances, I can only suggest that the reader imagine the position of sterling should the colonies begin drawing down balances at the rate they have been built up, and also become drawers on the dollar pool to the extent that they have been contributors in the past. Several other points raised by Miss Greaves do not seem to relate to my article, and although I disagree in part. I feel that no reply to them is called for.

5. I can agree with Kamarck that in a regime of convertible currencies the global balance of payments of a sterling country is an important criterion in

measuring a country's contribution to the external position of the entire sterling area. However, in the lopsided world of inconvertibility, the payments position vis-à-vis certain currency areas cannot be ignored, and a somewhat lopsided treatment of the problem becomes highly relevant. Kamarck points to the drain on central reserves arising from transactions with European Payments Union countries requiring partial payment in gold or dollars. But the distinction between dollar transactions and EPU transactions is one of degree not of kind from the sterling-area viewpoint. Deficits with the dollar area produced a roughly equivalent drain on the central reserves, while deficits with EPU countries led to partial drains on reserves, depending upon the quota position of the sterling area in the EPU at any given time. My article was devoted to the measurable aspects of contributions and drains on the dollar pool by sterling-area members, but the drain through EPU transactions (and transactions with other nondollar, nonsterling countries) does not lend itself to measurement by sterling countries, important as it was in the reserve problems of the sterling area. As Kamarck states, "as the world currencies become more and more convertible *de facto* the [global balance of payments] becomes more and more important." I agree, but sterling was not convertible during most of the period discussed, and the distinctions drawn in my article certainly apply.

6. The "principle of dollar-saving exports" was included in my analysis as an illustration of the pitfalls in measuring dollar contributions with the available statistics, but was not intended to exclude other statistical shortcomings such as those Kamarck points out. The "principle" does, I think, lead directly into the insuperable problem of measuring dollar contributions in the thorough-going economic sense, and I am certain that the extent to which each transaction of each sterling country does save dollars cannot be accurately measured. The question appears to be how far such analysis should be carried; Kamarck seems to suggest that it should never be attempted. As a solution, he proposes that both dollar accounts and the global balance of payments for each sterling country be examined as a basis for judging the contribution of each member to the sterling area's dollar problem. I believe my article has at least brought together the dollar accounts, but it is not clear to me what sound "judgment" could accurately be made by examining them in conjunction with global accounts for each sterling-area member, or whether two separate and objective "judgments" would produce the same opinion.

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BOOK REVIEWS

Economic Theory; General Economics

Man, Motives, and Money—Psychological Frontiers of Economics. By ALBERT LAUTERBACH. (Ithaca: Cornell University Press. 1954. Pp. xvi, 366. $5.00.)

Over many centuries, discourses on economic affairs have included explicit or implicit theories of human nature, of motivation, of calculations as to monetary costs and returns and as to utility and disutility. Psychological variables or aspects of economic life have been treated in innumerable book-sections and articles, but not many authors have felt called to the task of treating such matters at book length. Thus, the appearance of the volume here reviewed, soon after that of Katona's *Psychological Analysis of Economic Behavior,*[1] is an event of much interest.

Lauterbach, a teacher of economics, has had some associations with Katona and others in the University of Michigan Survey Research Center, and, as appears below, he uses some of the Center's output. It seems, however, that the bulk of his equipment and interpretations represent other trends in research—notably what we might designate as psychiatric sociology. Anthropological and comparative-economic materials are also fed into his hopper. Although the history invoked is mostly recent, in general his outlook is reminiscent of historical and institutional discussions of economic premises and methodology. His achievement, he says (p. 236), is "not by any means a general theory of economic psychology"; its "aspiration is far less ambitious. . . . The author feels no more ready to present any such theory than do most other researchers right now. He is also uncertain whether the disciplines concerned have cleared the way toward it sufficiently at this juncture."

The book includes eleven appendixes, a majority of which are derived from Survey Research Center publications, on such matters as industrial relations, views of large and small businesses, labor unions, and government, and "war dangers and worries." (This last phrase is in line with Lauterbach's strong emphasis on the incidence of personal insecurities.) One appendix appears to be based on a psychiatrist's notes; another, entitled "Incentives in Nationalized Plants in Austria," is based on interviews in that country by Lauterbach in 1950. The Survey Research appendixes contain tabulations, and these are given some discussion in the text-chapters; but in general Lauterbach does not display much enthusiasm for the quantitative psychological material now available. (But we must remember that the expenses of money, time, and effort involved in significant quantitative social research are prohibitive for most professors.) In addition to the novel material from the author's Austrian interviewing, this book contains many reflections of his cosmopolitan, polylingual background; and his writing is remarkably fluent

[1] Reviewed in this journal, Dec. 1953, XLIII, 931-33.

and clear, considering his tendency to manipulate more or less psychiatric concepts such as "parental images" and the numerous varieties of inferiority and insecurity states of mind.

In a few pages of introduction, three sets of problem-questions are indicated as giving the scope of the book. They begin as follows: "(1) To what extent does business behavior in our existing society actually follow those rules of economic decision making which economic analysis has assumed or developed? . . . (2) Assuming that economic instability, intentionally or not, is a concomitant of a private business economy, to what extent and in what ways has such instability prevented individuals and groups from acting 'economically'? . . . (3) To the extent that any such hope is legitimate, does economic reform of any desirable type presuppose a different kind of human being from the one that we have known thus far, especially in Western democratic countries? . . ." These themes are treated through four lengthy chapters, which are followed by a fifteen-page chapter of "Summary and Conclusions." (Here I recall Commons' remark, in *Industrial Government*, as to why he called the final chapter "Inferences" rather than "Conclusions.")

The language here quoted from the introduction almost suggests the author's (tentative) answers. Like many other "discussants" of such matters, Lauterbach finds actual behavior in business enterprises extremely variable, in part by reason of differing sizes of firms; and his conception of "those rules . . . which economic analysis has assumed or developed" appears to give insufficient weight to the institutional elements which are rather prominent in, *e.g.*, Mill and Marshall. Sensible economists have long, if not always, realized that the simple "model" of the immediate-profit-maximizing "economic man" is at best only a bare framework for the beginning of analysis of "capitalist" economy. And with reference to the second question quoted above, we may find much of interest and importance in Lauterbach's discussion of instability and insecurity. The phrase, however, "concomitant of a private business economy" might well lead to more consideration of the extent to which conversion of private-profit-seeking enterprise into private-nonprofit and governmental enterprises may be expected to effect a net reduction of insecurities.

The foregoing comments may indicate some of my notions as to important ingredients somewhat underrated in Lauterbach's treatment of his third group of questions—more directly concerned with motivation and reasonable expectations as to social-economic reforms. But on the whole his discussion here seems distinctly enlightening. He holds, of course, that a considerable range of (specified) targets of amelioration may be approached without "presupposition of a different kind of human being"; and through the book considerable research material is indicated as supporting this view. His optimism, however, is restrained and cautious, leaning perhaps toward the view that large enterprises such as the hydro-electric power project, about which he interviewed people in Austria, are most likely to be suitable for government ownership—if the public bureaucracy averages as high in ability and probity as the big-business bureaucracies of the nation concerned.

Z. CLARK DICKINSON

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Das Konkurrenzproblem im Oligopol. By RUDOLF RICHTER. (Berlin and Munich: Duncker and Humblot. 1954. Pp. 112. DM 8.00.)

The first half of this recent German contribution to the theory of oligopoly consists of an extensive and clear account of ten versions of the theory, *i.e.*, the models presented by Cournot, Bertrand, Hotelling, Frisch, Chamberlin, Stackelberg, Schneider, Kaysen, Fellner, and Brems. According to Richter, all are unsatisfactory, either because they assume the existence of a reaction function that is bound to turn out to be invalid, or because their solutions are merely subjectively, but not objectively, rational.

Richter's positive contribution is as follows. There are two distinct problems to be solved, one at the industry level, one at the firm level. Industry behavior is a matter of fixing the price of the industry's product, price and product being assumed to be common to all firms. Under such assumptions it is legitimate for Richter to draw a downward-sloping industry demand curve. At what point will industry fix its price? The reasoning here is far from clear, but let us reproduce it for what it is worth. Once the industry price had been set, industry sales would have been determined, and firms would regard firm revenue as being in direct proportion to the firm's quantity sold. Assume that production cost and selling cost as well are in direct proportion to quantity sold. Profits will then be in direct proportion to quantity sold and thus to firm revenue. So far we can follow Richter without difficulty. But then he says that since in an oligopolistic market the emphasis is on revenue and market share (one firm can gain revenue only by depriving another of revenue), then industry price is best set at the point where industry revenue is maximized. Richter seems to be aware of the fact that when costs exist industry revenue is maximized by a lower price than industry profits, but he does not convince his reader that industry revenue rather than industry profits should be maximized.

The second problem is to determine firm behavior. Once the industry pie has been determined, firm behavior will determine the slices of the pie falling to each firm. What are the variables used for this determination? Price being now beyond the control of the firm, and quality of product being assumed to be constant and identical as among firms, only advertising remains. But even here there is the constraint that advertising cost per unit of product sold must remain constant. So firms fight for market shares not with advertising budgets but merely with good ideas as to how to spend those budgets. Jastram is quoted in defense of this assumption which sounds quite realistic.

The stage is now set for the determination of firm behavior. A solution is found in the theory of the zero-sum two-person game as originally developed by von Neumann and Morgenstern. The game is two-person, because duopoly is the only case considered by Richter, and it is zero-sum because of a neat little trick. A's result of the game is defined by Richter as A's revenue *minus* B's revenue, $r_A - r_B$. B's result is defined as $r_B - r_A$. Under the set industry price, industry revenue $r_A + r_B$ is constant; call the constant K. Then $r_A - r_B = 2r_A - K$, from which we can see that what maximizes r_A will also maximize $r_A - r_B$. Likewise it can be seen that what maximizes r_B will also maximize $r_B - r_A$ or, which is the same thing, minimize $r_A - r_B$.

Hence the profit maximization game is zero-sum, for under constant price and constant per-unit cost of production and selling what maximizes revenue also maximizes profits.

Richter now introduces the assumption of perfect information in the strictly technical, *i.e.*, von Neumann-Morgenstern sense. This means that each player who makes a personal move is perfectly informed about the outcome of the choices of all anterior moves by his adversary. Van Neumann and Morgenstern, as we know, have shown that in games in which perfect information prevails, permanently optimal, pure strategies exist. Disliking the mixed strategies, Richter is very fond of this result. It permits him to reach a purely objective solution of his problem. No estimates of probabilities of rival action, no reaction curves, no attempts to find one's adversary out!

Apart from the maximization-of-industry-revenue procedure, where the reader may be pardoned for remaining unconvinced, Richter is correct within his own assumptions. But how narrow are the confines of those assumptions? Imagine a game in which every move requires careful and time-consuming preparation and, consequently commitment long in advance. Perfect information is ruled out by the very nature of the game, and there is a high premium on finding out the adversary. Suppose the German High Command had found out the time and place of the Normandy invasion, or the Allied Command the time and place of the Battle of the Bulge!

When facing a situation like this, the theorist can do two things. He can face reality squarely and come out with a subjective rationality. Or he can insist upon objectivity and refuse to admit any phenomenon which could play havoc with his assumption of perfect information. In oligopoly, one such phenomenon is product-quality variations, for they require research, designing, production engineering and tooling-up; in short they require commitment far in advance. Although he emphasizes the nonprice variables, Richter refuses to consider the quality of the product as a variable. The exclusion of quality variations is defended in the interest of "the exactness of our analysis."

As an exercise in objective and exact solutions, and as one of the few applications of the theory of games to oligopoly, Richter's book is useful, not the least because it clearly reveals the frightening height of the price that must be paid for objectivity and exactness.

HANS BREMS

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Economics and the Public Interest. Edited by ROBERT A. SOLO. (New Brunswick: Rutgers University Press. 1955. Pp. xiv, 318. $5.75.)

This is a collection of twenty essays, plus a short preface by Arthur F. Burns, contributed by former students and colleagues at Rutgers University to mark and honor the seventy-fifth birthday of professor emeritus Eugene E. Agger.

As is almost inevitable in a collection of this kind, the offerings are of uneven merit. Most are clearly written. Several are spirited. But only a few create a lasting impression.

The longest and most likely reference article is by Geoffrey H. Moore, entitled "The Diffusion of Business Cycles." Dipping into the National Bureau's informational stores he presents percentage "diffusion" measures which register the number of industries expanding and contracting. Finding that these indexes lead other measures of aggregate activity, Moore suggests that they ought to "contribute to a proper timing of measures taken to . . . promote recovery" and "they may be helpful in appraising the efficacy of such measures" (p. 58).

In a more provocative piece, on "Rain Making and Monetary Policy," Anatol Murad contends that advocates of monetary controls are indulging in magical dreams. Examining four recent reports he observes that in each case "the writers . . . recognize the failure of monetary policies, yet blandly urge greater reliance upon such policies" (p. 147). Even if his position is overstated, his evidence is of interest.

In a deterministic setting Leopold Kohr ("Economic Systems and Social Size") argues that "if a community is either too small or too large" then "the only possible system is . . . a system of discipline, direction, control. Economically speaking, this means socialism" (p. 208).

A clear position and a fast pace characterize "Colonial Experience and the Social Context of Economic Development Programs," by Harry D. Gideonse. Citing Indonesia, for "its recent history demonstrates so eloquently the hollowness of the usual 'anti-colonial' cant about unilateral exploitation" (p. 250) he attacks the proposition that freedom and advance can be transplanted "by a flow of financial grants matched with a vague desire for material improvement" (p. 257). In contrast Broadus Mitchell ("The Poverty of Economics") holds: "We are at this instant reaping the bitter fruits of imperialism and colonialism." Through free trade, which was merely a "British axiom," other peoples "were repressed . . . into primitive production and lopsided development" (p. 31)

The opening essay is an arid methodological item by Solo on "Economics as Social Philosophy, Moral Philosophy, and Technology," which particularly violates his editorial canons on "significance and clarity." A more lucid note by William C. Bagley, Jr., on "The Task of Institutionalism," chastizes economics for neglecting "culture" though he does not show how the new institutionalism transcends the old. He suggests that theory will disappear when "everyday experience" is studied (p. 21). Occupational unemployment for the theorist is not a new forecast.

Broadus Mitchell thunders in lively scorn and wrath at friend and foe. His range encompasses the classicists, diminishing returns, formal convention papers, academic stock-market forecasters, Keynes in academic gown, Keynes in business suit, Keynes the Judas-goat, politicians, scholarly journals, mathematics, model builders, compensatory finance, full employment, colonialism, etc. He is reassured though that "economics, after all, is not a science but an art . . ." (p. 29). And he reveals that to "turn the gross mass of poverty, ignorance, disease and death into the gold of peace, plenty, and progress" involves "no secret beyond good-will and good judgment" (p. 30).

In a modest statement on "Marketing's Contribution to Economics," R. S. Alexander queries whether a price reduction leaves the demand schedule

unchanged, suggesting that expectational forces may engender a sales decline. These dynamic relations are too frequently ignored. Also, he avers that demand inelasticity (in the neighborhood of accustomed price?) is more common than usually supposed. And he rightly criticizes the extensive preoccupation with a single-product firm.

Sidney I. Simon offers a useful survey of accounting and legal definitions in "Profits, a Semantic Problem Child" and J. Wilner Sundelson, a specialized study of "Forecasting Automotive Sales." Ridgeway Hoegstedt ("Economics and Accounting") wells with pride in reiterating that "accounting is essentially a consensus" of standardized conventions. This he regards as virtue enough. His gentle, scholarly rejoinder to economists is that they "have urged that it [accounting conventions] be replaced by a body of controversy resting on linguistic confusion" (p. 118). His profound, pontifical advice to economists is that "the subject matter of economics is not mechanism, but mankind" (p. 119).

Alexander Balinky covers "Public Finance and the Public Interest," Monroe Berkowitz, with some good insights on the union shop, develops "Public Policy and Union Security," Lawrence Knappen outlines "Managerial Zones of Reasonableness in Public Utility Regulation," and Max Gideonse examines "The Development of International Commodity Policy." Reviewing price stabilization programs, Gideonse decides "that the inherent defects of government control schemes normally outweigh the defects of the free market . . ." (p. 225).

David A. Morse devotes "International Employment Problems and Policy" substantially to the work of UNESCO and the ILO. Kenneth Kurihara follows Harrod's path in a brief coverage of "Growth Theory and the Problem of Economic Stabilization." Robert J. Alexander elaborates mainly some British and Russian history in considering "Who Bears the Cost of Economic Development?" Finally, Roland R. Renne closes with "Land Tenure Reform as an Aspect of Economic Development in Asia." Economic theory today, compared to the older tradition, perhaps pays too little attention to diverse rental methods as an influence on allocational efficiency.

Amid this assortment, and almost in the very middle of it, Milton Friedman has a paper on "The Role of Government in Education," concerned not with the content, nor facilities, nor recruitment of educational personnel but instead with a proposal to separate the financing and administration of education. It is surprising to learn that elementary education is a "nationalized" industry. In Friedman's scheme: "Government could require a minimum level of education which they could finance by giving parents vouchers redeemable for a specified maximum sum per child per year if spent on 'approved' educational services" (p. 127). Doing so, "Government would serve its proper function of improving the operation of the invisible hand without substituting the dead hand of bureaucracy" (p. 144). Though he properly abhors racial segregation, the same anxiety for freedom, this time of those who *choose* segregated schools, enables Friedman to see a saving grace in the plans of some Southern states to abolish the public school system.

SIDNEY WEINTRAUB

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Theorie der allgemeinen Volkswirtschaftspolitik. By HANS-JÜRGEN SERAPHIM. (Goettingen: Vanderhoeck & Ruprecht. 1955. Pp. 351. DM 30.-; cloth DM 33.-.)

The American reader may find the title and the structure of this book somewhat puzzling, if he does not relate them to the typically German approach of the author. For more than a century, German economists have stressed, in their thinking, their research and their teaching, a systematic distinction between the theory of economics and applied economics. They gradually developed the latter into a self-sustaining discipline of economic policy, and in due time they proceeded to divide this new discipline into general and specific parts as well as to bolster it with a theoretical foundation of its own—hence their "theory of general economic policy." It is rather difficult to draw any clear-cut borderline between this theory and the theory of economics. However, decades of professional experience and skillful handling of systemological intricacies have helped the author to overcome some of the obvious difficulties concerned. His efforts have been facilitated by two characteristic attitudes. In a traditionally German way, he explicitly emphasizes the methodological aspects of economic policies and consistently inquires into their sociological background.

Accordingly, the first part of the book is devoted to a reconsideration of relevant old and new methodological debates. The outcome is a series of analytical refinements pertaining to the permissible scope of theoretical abstraction, to the issue of value judgments, to up-to-date model building, and to the bearing of these refinements on the relation between theoretical and applied thinking in the domain of economics. The author's rejection of catallactic economics of the pure exchange-theory pattern as a sufficient foundation of economic policies leads him to an examination of the essential social factors involved.

His sociological appraisal of these factors, which represents the core of his achievement, is concentrated on the phenomenon of economic power as well as on the basic forms of economic organization, respectively treated in the second and third parts of the book. Among the strategic conditions of effective economic power, he successfully analyzes the required personal qualifications and purchasing power, and he adds illuminating remarks on some of the related functional aspects of social structure and economic equilibrium. His morphological comments concerning the basic forms of economic organization reveal the effects upon the market resulting from the development of the tribe, family, medieval feudal and corporate ties, modern private enterprise, class stratification, and economic collectivization. He then makes a stimulating attempt to explain such effects in terms of the historical epochs of economic policies.

The fourth part of the book deals with the subjects, ends, tasks, means and "systems" of economic policies. Most likely, this part could have been profitably expanded even if it were at the expense of the three preceding parts. In particular, it would have been useful to elaborate further on the relationship among the economic categories of "systems," "orders," "proc-

esses," and "fundamentals" determining the over-all goals of economic policy. Nevertheless, it is fair to add that such categories have been abundantly discussed in the economic literature of German-speaking countries; that the author has contributed to the clarification of several relevant penumbrae; and that it would have been beyond the scope of his "general" theory to penetrate specific problems of applied economics.

Possible improvements in the book may be suggested: First, some of the methodological classifications are too rigid. For example, the distinction between economic policy and economic guidance (pp. 326 ff) and the enumeration of seven models reflecting "systems of economic policy" (pp. 334 ff.) should be relaxed and more directly referred to what is usually meant by economic systems. Second, some of the essential theorems should be refocused in order to include more convincing arguments. For instance, the analysis of individual and collective wants (pp. 241 ff.) should be reconsidered in the light of such intermediate cases as relative and absolute social wants, common wants and group wants. The application to economic policies would then be more plausible and efficient. A somewhat similar result could be achieved by reclassifying the five means of economic policy (pp. 300 ff.) and by shifting their emphasis toward empirical differences in the degree of governmental intervention. Third, although it is undoubtedly justifiable to stress the qualitative factors of economic policies, the concomitant quantitative factors and their analysis should also be given adequate attention.

All in all, this book offers a substantial contribution to several neglected chapters of economic methodology and systematology. Especially valuable are its frequent references to the historical development of the doctrines expounded. The author's excellent coverage of recent German economic literature in itself would warrant an English translation.

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Kapitaltheoretische Untersuchungen. By WALTER EUCKEN. 2nd edition, enlarged by 3 essays (Tübingen: J. C. B. Mohr. Zürich: Polygraphischer Verlag. 1954. Pp. xxvii, 336. DM 18.80.)

This volume reprints the *Kapitaltheoretische Untersuchungen* first published by Walter Eucken in 1934. Eucken follows Böhm-Bawerk in basing his interest theory on the productivity and scarcity of capital. In common with the Swedish followers of Böhm-Bawerk, such as Wicksell and Akerman, Eucken frees his analysis from the discount idea that interest reflects a low valuation of future as compared with present goods. He rather stresses the higher productivity of production through time. Interest appears as the payment for the services of capital which permit more time-consuming and therefore more productive processes; it is determined by the general equilibrium of the economy. Böhm-Bawerk toward the end of his *Positive Theory* had already discussed interest in a general equilibrium setting under the simplifying assumptions of only one productive agent and a single product.

Wicksell developed the theory of interest with more than one productive agent and several final products. Eucken considers the production of consumption as well as capital goods and adds the idea that the nature of all inputs changes with a shift in the time period of production.

Though Eucken explicitly recognizes the production of capital goods, he treats the total amount of productive agents as a given constant and thus appears perhaps the last exponent of a "stationary" interest theory. In later essays reprinted as an appendix to the present volume, and in unpublished notes left at the time of his unexpected death in 1950, Eucken attempted to push beyond the limitations of static analysis. Following Hayek, he gave up the idea of an average production period. Under the influence of Keynes, he recognized the role of monetary factors in the determination of the interest rate. Stimulated by his student Lutz—who has contributed a masterly introduction to the new edition—he concerned himself with the structure of interest rates. All this was leading Eucken from static interest analysis toward the search for a more dynamic theory of capital formation and of the economic development which distinguishes succeeding investment periods.

The *Kapitaltheoretische Untersuchungen* may not add much to the main body of economic theory. Yet they stand out as a valiant contribution to rational economic analysis at a time and place given to emotional propaganda rather than rigorous theory. When first published in the Germany of 1934, Eucken visualized his work as the beginning of a new series on "problems of economic theory" and prefaced it by an inquiry on "what does economic theory contribute?" It is this introduction on economic methodology which established Eucken as the great teacher who preserved the tradition of economic reasoning through a decade of totalitarian dictatorship and who prepared his students to help in the re-establishment of a free German economy.

WERNER HOCHWALD

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Public Policy. A Yearbook of the Graduate School of Public Administration, Harvard University, Volume V. Edited by CARL J. FRIEDRICH and J. KENNETH GALBRAITH. (Cambridge: Graduate School of Public Administration, Harvard University. 1954. Pp. viii, 420. $5.00.)

This book contains a variety of papers without central theme or unifying organization plan. It opens with the text of a lecture by Eugene Meyer, substantially devoted to reminiscences of his diversified experience in the federal service, including the management of prices in World War I, the War Finance Corporation, the Farm Loan Board, the Federal Reserve System, and the Reconstruction Finance Corporation. Part II presents two case studies of antitrust policy, one dealing with the International Business Machines Corporation and the other with the textile machinery industry. Part III contains three papers under the general heading of Planning and Resources Policy: one on watershed flood control, the second on planning research for defense, and the third on the formulation of economic policy in postwar France. Part

IV—Fiscal and Monetary Policy—offers the following assortment: "Monetary-Debt Policy Revisited," "The New Monetary Policy," "Some Aspects of Family Allowances and Income Redistribution in Canada," "The Canadian Exchange Rate," "The Limits of Taxation," and "The Income Tax of France." In Part V are found two papers on Legislation and Parties, one on "Congress and the Fair Deal" and the other on "Party and Separation of Powers."

The usual comment on quality range in such a collection is in order. Contributors include graduate students and senior professors. In appraising a pudding concocted from such mixed ingredients, the reviewer's useful function is to identify the choice plums and hold his peace for the rest.

The most interesting papers are those by Preston on the textile machinery industry, Houghteling on the French income tax, Peret on the limits of taxation, and Musgrave on monetary-debt policy.

Preston's study suggests that the disposition to transfer antitrust policy from a foundation in abusive and predatory practices to a foundation in market power offers an adventure in uncertainty. Since 1920 the textile machinery industry has seen the number of firms producing a full line of cotton preparatory machinery decline from nine to two, the number of loom-makers from five to two. Yet all the normal monopoly tests indicate ambiguous results: in overt restraints on trade, in measures of industrial performance. The intriguing implications of performance in what should be a classic arena for monopolistic manipulation urge the extension of such industry analysis before we are too far committed to the superficially attractive economic concepts as a satisfactory substitute for the traditional legalistic approach to antitrust problems.

Houghteling's study of the French failure to establish effective and equitable income taxes concludes that the root of the difficulty is not a dearth of ideas for reforming the tax structure, but a distribution of political forces that impedes constructive action. In contrast to the tendency in nations with relatively advanced economic development to rely heavily on income taxes, in France income taxes have never produced more than one-fourth of the central government's tax revenues. The aggregative tax burden is heavy, is slightly but irregularly progressive, and is in no sense archaic. The system's principal influence is toward perpetuating characteristics of the French economy that act as drags on economic development. Those with a vested interest in these characteristics are sufficiently powerful to compel policy compromises that fail to convert the tax system into a force for economic progress.

Peret begins with Colin Clark's thesis on the critical limit of taxation. He observes a lack of consistency between the hypothesis of the critical limit and its statistical underpinning. From a review of taxation and economic performance he concludes that taxable capacity is a variable responsive to national resources, their level of utilization, the level of technological development, and the rate of general economic growth. There is no record to support the proposition that the level of taxation in the United States has contributed to either adverse effects in the area of economic development or to inflation.

Musgrave undertakes a reconsideration of the monetary-debt-unemployment-inflation complex with emphasis on removing false issues created by attempting to convert incomplete analysis into policy criteria. This leads him to two conclusions. The first is that monetary-debt and fiscal restrictions are related, not independent, tools, and therefore require resolution within the framework of a general stabilization policy. The second conclusion suggests that the nature of this resolution—the "product mix" of monetary-debt and tax measures—may contribute to important differences in results. These are found in income distribution, in resource allocation, and ultimately in the rate of economic growth.

MELVIN ANSHEN

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Economic History; National Economies; Economic Development

Approaches to Economic Development. By NORMAN S. BUCHANAN and HOWARD S. ELLIS. (New York: Twentieth Century Fund. 1955. Pp. xiv, 494. $5.00.)

Underdeveloped areas are backward in more ways than one. The lack of capital accumulation not only is not the whole story, it is no more prominent that the backwardness of social institutions, cultural attitudes, personal habits and aptitudes, and the bureaucratic inefficiency of governments. A good introductory book on the development of such areas should begin not with growth models and other elaborate machinery, but with the empirical contents of the subject—the characteristics of the people and their institutions, and policy problems expressed in the form in which they present themselves in backward areas. Capital accumulation can be given a central position, but not one that eclipses the less tangible problems.

Ellis and Buchanan have written such a book, and written it well. One pays a price for it; the result is not exciting reading, it is quite untheoretical reading, with no original machinery of analysis and no new program, and often concerned with organizing the obvious. Even the original ideas do not seem original, since they must be on a low level of generality and somewhat mundane in their contents. The result is an excellent text for students but a chore for economists. It is a rewarding chore, but not in intellectual stimulation.

The book could have been somewhat more exciting, and the better for it. Omission of repetitions would have saved space for more advanced sorties; and parts of the book would have been improved by abstract models. Some Malthusian models would have helped the discussion of population; and the treatment of inflation, investment, income growth, and balance of payments could probably have been made more rigorous and less ambiguous without belaboring multipliers excessively. But the purpose of the book is mainly responsible for its lack of climax and stimulation; and the purpose is a proper one.

The scheme is good. Part I, 116 pages, introduces the characteristics of underdeveloped countries, discusses resources and their use in relation to per

capita income, and then gives three chapters of equal weight to capital accumulation, social and cultural factors, and demographic factors. Part II, 115 pages, contains brief histories of the economic developement of England, Japan, France, Germany, and the U.S.S.R., and an historical summary. Part III, 232 pages, is on contemporary problems and policies: development of agriculture, of commerce, of industry; saving, financial institutions, government finance; foreign trade; foreign capital; assistance program for underdeveloped countries; and a chapter on the interests and responsibilities of the United States. For class use Part II could be taken first, last, or where it is, or left out, without disturbing the organization. The reviewer's first inclination was to leave it out, as insufficiently productive of easily transferable policy conclusions; on reflection he is persuaded that its provision of "perspective"—which was the authors' main purpose for it—earns it a firm position somewhere in the book.

The book is least satisfactory where it is most theoretical. The role of capital in production and income generation leans excessively on the concept of factor *proportions* in Chapter 2, and at several points (pp. 42 and 47) seems to confuse income with real wages and to ignore the return on productive assets. For example, "If labor were completely substitutable for land and capital equipment in production, then the dearth of land and capital relative to labor in the underdeveloped areas would make no difference: output per person could be just as high as in the high-income countries" (p. 42). Thus, even though the authors preface their remarks on labor and its productivity with the statement that "unlike land and capital, human beings are at once a factor in production and the end purpose of economic activity," they do not avoid the analytical pitfalls involved. They do, however, avoid a lot of other pitfalls, especially the obstinate one about all differences in labor productivity among countries being due to the quantities of land and capital available; and for their excellent discussion of social, cultural, and personal differences among workers and their productivity they deserve congratulations.

The treatment of inflation is ambiguous. The implicit criterion for fiscal stability seems to be something like constancy of the ratio of money to income (pp. 308, 312, for example) but the implications of this criterion are not carefully handled. There is a hint or two (pp. 308, 312, 388) that noninflationary investment is investment that leads to "an equal flow of marketable product," but this concept has no meaning except in an explicit time-sequence analysis. A number of statements on fiscal stability depend on unstated premises—statements about the comparative inflationary effects of government deficits vs. private deficits (p. 312), commercial bank loans vs. other forms of financing (pp. 307-8), the inflationary effect of capital inflow (pp. 388, 398), and the "income velocity" multiplier (p. 388). With a little thought one can usually provide the particular premise that makes the statement understandable; but the effect on students will be confusion.

Other deficiencies—mentioned here to advise, not to discourage, the user of the book—are: inadequate attention to the exchange rate in discussing the "productivity" criterion for allocation of investment; undue identification of the "productivity" of foreign capital with the specific imports financed by

the foreign exchange (pp. 391-92); similar identification of a country's capacity to service foreign debt with the specific investment projects financed by foreign loans (pp. 394, 398); the absence of systematic discussion of whether the "unseen hand" of the price system and profit motive is, in principle, an ideal allocator of investment, *i.e.*, whether private and social productivity can be identified with each other; insufficient attention to the influence that income distribution objectives will have on the allocation of development among the industries and areas within a country; and a neglect of the critical question of the appropriate rate of capital accumulation (in a time-preference, social stability sense, rather than a fiscal-monetary one) except where the authors use this topic to divide economists rather ruthlessly into two comprehensive schools of thought.

A reviewer can pick faults endlessly from a book that tries to lay an elementary groundwork; the present book has the usual share of deficiencies of a good text, not more. The footnoting is excellent; for people either teaching a course, or briefing themselves on the rudiments of the subject, it supplies a well selected reading list parallel to the text.

As remarked above, the book is not much fun, and probably was not for the authors either, since they had to discipline themselves on nearly every topic. The reviewer, who shares the authors' prejudice on how to approach the subject, thinks the result well worth the labor.

THOMAS C. SCHELLING

Yale University

Economic Development—Principles and Patterns. Edited by HAROLD F. WILLIAMSON and JOHN A. BUTTRICK. (New York: Prentice-Hall. 1954. Pp. xii, 576. $6.75.)

"Underdevelopment" has reached the textbook stage. Since the war, the problems of the less developed countries have occupid a prominent place in economics. Once the great debate about monetary and fiscal policy and about the dollar gap had blown over, no other field in economics, it is probably fair to say, has been so fruitful in new ideas as that of development. Here the discussion is still very much in flux. It is gratifying to think that enough systematic material has accumulated to encourage some bold spirits to write a book addressed chiefly—not exclusively—to college students.

It is not possible, in the framework of this review, to do full justice to all the contributions, but some of the outstanding ones deserve special mention. Harold Williamson opens the book with a thoughtful essay on the meaning and measurement of development. Here the reader finds all the questions, and probably some more, that may have worried him as he contemplates the current developmental scene. J. Spengler contributes an interesting essay that opens up the whole range of population problems. His bold speculations with concrete magnitudes are intriguing, as always. John Buttrick's chapter on capital formation represents, for the analytical point of view, the heart of the book. Nevertheless, I doubt that the casting of familiar propositions into new diagrams, however skillfully done, is of real help to the often broadly

diversified group that meets in development courses, variously known as an interdisciplinary cross-section or motley crew.

Yale Brozen's extremely interesting piece on entrepreneurship and technological change deals with the two analytically and statistically most baffling subjects in the whole field. Here we find the chief discussion in the volume—and only too short—of alternative directions of development. He also suggests methods for stimulating the supply of entrepreneurship, which he regards not so much as a problem of creating the spirit as of removing barriers.

The chapter on cultural factors by Francis L. K. Hsu has much to say that is fascinating to the economist. Hsu sees the source of Western economic pre-eminence in the sense of insecurity that stems from Western individualism. If the various doubts that this theory raises can be resolved, it may have many fruitful implications.

The three closing chapters on individual countries are all excellent. Each demonstrates a different aspect of development. Irene Taeuber, writing on population growth in Japan and Korea, gives the clearest account I have yet seen of the impact of industrialization upon population growth. Helen Lamb describes the immense problems besetting India's economic development. Henry Aubrey analyzes Mexico's rapid growth. Rising inequality of income, allowing a high rate of capital formation, seems to have been an important causal factor.

The book as a whole shows that the field of economic development has not yet shaken down to anything like the well systematized—and somewhat deadening—organization encountered in many other branches of economics. Wide differences of view are to be expected as to what belongs, and where. The present volume has the virtue of a broad-gauged approach, in addition to containing many valuable contributions. On the other hand, it does not deal with any of the general growth theories, nor does it take cognizance of the important current debates, stirred up by the ideas of Prebisch, Singer, Rosenstein-Rodan, and many others. In particular the book is short on policy.

In consequence, it is not easy to tell from the volume exactly where developmental economics stands today—except that it seems to be entering the textbook stage. Some years ago, development theory seemed to be in a phase somewhat analogous to the early stages of Keynesian economics. Much of the theoretical equipment evolved in advanced countries was being rejected as inapplicable to the less developed areas, and, as in the early Keynesian phases, a new economics was being demanded. Some bold and revolutionary ideas came to the fore at that time. Today there seems to be less inclination in development thinking to emphasize the novel and the extreme. There is less of a tendency, for instance, to identify development exclusively with industrialization. The belief in the effectiveness of inflation as a vehicle for development seems to be waning. Perhaps—though this is doubtful—one may discern a somewhat more liberal attitude toward international trade and foreign investment.

It seems also that the pessimism connected with the earlier belief that capital-output ratios for underdeveloped countries were very high, and that very large amounts of capital would be required to achieve a modest degree of development, has yielded to often rather optimistic assumptions. The capital-output ratio as an instrument of developmental thinking and planning has found wide acceptance, sometimes perhaps a little uncritically. The population problem is beginning to be viewed as amenable to policy, and not as subject solely to uncontrollable social and biological forces. Finally, there seems to be less interest in general theories of development and more in detailed analysis of specific problems, though the hope of finding the philosopher's stone of a really universal theory no doubt springs eternal.

Such are the year-to-year issues that are hotly debated for a while and then often laid aside. Of them our volume takes little cognizance. Perhaps that is the part of wisdom in a book that is not intended to be rewitten every two years. It is to the understanding of more permanent problems that the Williamson-Buttrick volume makes its contribution.

HENRY C. WALLICH

Yale University

The Economic Future of Canada. By H. M. H. A. VAN DER VALK. (Toronto and New York: McGraw-Hill. 1954. Pp. 206. $4.75.)

This book was originally written in Dutch by a distinguished Dutch economist in order (as he says in the foreword) ". . . to share a stimulating friendship with [his] own countrymen—many of whom have set out to make their home in a country of which they had only vague impressions." The Canadian edition proceeds to do just this for a much wider readership.

The initial chapters describe the essential characteristics of the Canadian economy in the usual order—the frontier, the population, national income, the resource pattern, industry and transportation. The blossoming growth floodlighted in these early chapters is then analyzed in fuller macro-economic terms—international trade, capital movements, investment and monetary policy. The culminating pages make some broad and perfectly acceptable projections into Canada's economic future.

The descriptive chapters provide an excellent compilation of generally available data in brief, well-organized, and readable style. The analytical section operates within an outline of the Canadian financial institutions, trade structure and public policy. To both parts the European observer brings, at intervals, a fresh awareness of things North Americans sometimes neglect because they are, though extremely important, extremely commonplace. For example: "The European coming to Canada and the U. S. is generally impressed by the large amount of productive work done voluntarily. For this reason the Europeans have a wrong idea about the five-day week. The so-called 'free Saturday' is for many one of the busiest work days of the week, a day of work for themselves" (p. 169).

Constructive criticism can be aimed on two levels. For the uninitiated, "beginner" on Canada, the initial chapters on the frontier and the resource

pattern would have far more meaning if they were projected against a broad framework of the geography and geology of this tremendous region. Moreover, at least to the North American reader, resource development hinges much more emphatically upon public policy both on the national and the provincial level than the European writer perceives. Likewise, a great deal more light could be shed on developing Canadian economic (and broader) policy had there been a clearer statement of the role of the French-Canadian. (Bilingualism is not merely an interesting cultural phenomenon.) One or two points on a lower level undoubtedly reflect the problems encountered in distilling a tremendous subject. Discussing transportation, the author concentrates on the St. Lawrence seaway (with an adequate supply of the by-now familiar diagrams and maps). In effect, a newly groomed tail wags an important dog. Canada's transportation picture is complex. Not least important is the leading role in contemporary expansion played by the country's historic overinvestment in railroads. As a by-product of this, the author may contribute to the impression that Ontario province is an area rich in hydro-electric power. Niagara redevelopment and Ontario's share of St. Lawrence power notwithstanding, power in the future of the eastern region focuses attention on Quebec and Labrador (a sector often eclipsed by the glamor of the Yukon and Northwest Territories' development).

In passing, it may also be difficult for the student of the Canadian economy to accept the relatively minor role given to the United Kingdom's historical position in both financial and entrepreneurial capacities. The modern, independent stature of Canada and the current influx of capital from the United States should not cast a shadow over the real and (even presently) substantial British contribution to the Canadian scene.

Professor van der Valk has made good use of a significant part of the fine array of material now available on Canada and, all things considered, has done very well in condensing encyclopedic information in two hundred pages. Given the present level of ignorance among American college students as to the Canadian economy, the book should find a wider readership than it probably will. To those who do read it, the book's few, well-chosen footnotes will open excellent doors for further reading on Canada.

On the whole, the reviewer feels this is a useful introductory volume on the Canadian economy despite the blemishes undoubtedly induced by the pressure for brevity.

FRANK A. FARNSWORTH

Colgate University

A Report on Monetary Policy in Iraq. By CARL IVERSEN, assisted by P. WINDING and P. N. RASMUSSEN. (Copenhagen: Ejnar Munksgaard Pub. 1954. Pp. 331.)

Professor Iversen joins the growing ranks of Western academicians whose advice has been sought by governments of underdeveloped countries, and gives a highly readable analysis of financial aspects of the development of Iraq. Prepared at behest of National Bank of Iraq, the report is concerned

with monetary policy in its wider sense (*i.e.*, credit, foreign exchange, fiscal, and investment policy).

Iraq, oil-rich, relatively underpopulated, but poverty-stricken, launched a developmental program in 1950 as much from the pressure of expanding oil royalties as from the basic desire of raising living standards. Iversen considers the ideal rate of expansion as one which proceeds as rapidly as consistent with avoidance of inflation and maintenance of adequate exchange reserves; and he analyzes alternative courses of development. The reader is run through a Keynesian gauntlet of autonomous investment, induced effects, one-shot and continuous doses, marginal propensities, closed and open multipliers, accelerators and endogenous cycles. Whether the desired pace is maintained depends further on reaction-time lags, producer expectations, and inventory policies. The way may also be littered with supply bottlenecks (*e.g.*, shortage of skilled manpower and entrepreneurship). If local bottlenecks become generalized, development is retarded and cumulative wage-price inflation threatens. However, the reader is reassured, Iraq enjoys a unique advantage over other underdeveloped areas in its relatively large foreign exchange reserves. This permits it to plan for development without fear of balance-of-payments adversities, and to combat inflation by calling upon foreign supply sources.

Having analyzed the situation of an underdeveloped area exposed to "advanced" ailments, the report considers the applicability of "modern" remedies. Credit policy is hampered by institutional obstacles (*e.g.*, domination of money market by foreign banks and absence of a capital market). Even if these were overcome, Iversen doubts whether credit policy in itself would be effective in containing generalized inflation. Fiscal policy is similarly found lacking. This leaves it up to the Development Board to plan its activities so as to balance approximately available supplies and total demand. Finally, Iversen considers whether Iraq should leave the sterling area in an attempt to preserve the purchasing power of its foreign-exchange assets and concludes that no clear gain would result, unless sterling becomes convertible or Iraq significantly increases its dollar earnings. Since neither possibility seems realistic at present, the country should concentrate on improving its bargaining position within the sterling area.

It may be questioned whether the analytical apparatus employed comes to grips with currently, rather than potentially, relevant problems of underdeveloped areas, and whether sufficient attention has been paid to longer-term institutional adjustments necessary for effectiveness of modern policy prescriptions.

SHELLEY M. MARK

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Indian Village, By S. C. DUBE, with foreword by M. E. Opler. (Ithaca: Cornell University Press. 1955. Pp. xiv, 248.)

"Instability" in the industrial labor force of underdeveloped countries is assumed to interfere substantially with the effective allocation of human

resources in a country developing its industries. High rates of absenteeism and turnover, low rates of labor productivity, poor work habits, plant indiscipline are all phenomena associated with a work force recently settled in industrial centers. Most students trace the lack of worker "commitment" to the workers' hybrid affiliations, partly industrial and partly agricultural, to the "village nexus." It is argued that new industrial workers are often unable so sever the umbilical cord that ties them to the village. As industrial workers they appear motivated by the mores of the village rather than those of the city. They are "in the city but not of the city."

Study of the socio-economic structure of villages in underdeveloped countries has a place in the study of economic development even if one rejects the "village nexus" hypothesis. After all, the majority of the economically active population of most underdeveloped countries is to be found in villages. It is there that underemployment and unemployment is most marked and it is in the villages that economic and social growth is to make its greatest strides.

Dube's *Indian Village* provides the student of economic growth in underdeveloped countries with an excellent base line study of the social and economic life of a villager.

Shamirpet is a village of less than 3,000 people located about twenty-five miles from Hyderabad, in South India. Although the author claims no particular typicalness for it, Shamirpet possesses characteristics common to most rural communities in India. In its economic constitution Shamirpet shows features present in the villages of most predominantly agricultural countries. All aspects of village life are surveyed to ascertain to what extent social, economic and political changes currently taking place in India and the world are affecting it. Changes in the role of the family, the caste, the village council are reported with clarity and in language void of narrow professional jargon. Much emphasis is placed on the nature and change of ritual and on the web of family ties; yet at least 105 pages of the 235 pages of the text deal directly with the economic structure of the village.

Dube provides the reader with an occupational breakdown of the total population. The dependence of the great majority of the population on the productive activities of the few (only 336 people find full-time employment and produce the food consumed by the village); the extremely small number of people engaged in activities not connected with agriculture (only 331 persons find occasion to work in areas other than agriculture and of these 90 are government servants); and the very high level of underemployment—all characteristic of the economy of underdeveloped countries—come vividly to the reader's attention.

Land distribution as well as that of other assets is discussed. So are the complex exchange relationships which show the carry-over of traditional division of labor and the role of caste.

Shamirpet is no isolated center of the hinterland, being connected to the capital by no less than 12 busses which go through the village every day. Nor is the village economically independent: "the economy of the village is only partially self-sufficient" (p. 87). Consumers and producers goods (the weavers' spindles) are imported from the nearby capital. Labor is exported

in the trickle of workers that bicycle to the capital to look for employment as often as to go to work. Precisely in the analysis of the village dependence on the rest of the world lies the book's importance. Dube notes that: "For over a century 'the timeless and changeless Indian Village' has been the ideal of the romanticist" (p. 212).

Changes that had been in the making in the last seventy-five or a hundred years and which became more marked after 1948 are looked at in detail. Although much concerned in social changes the author finds that most are traceable to changes in the "material culture and technology" and argues from the readiness in accepting earlier changes that "it is justifiable to predict that given suitable conditions the tempo of change would greatly increase" (p. 235).

The economic situation of present-day India whose rapid economic development has surprised many Indian and Western economists is made to hinge on the rapid "spreading of the market." For an understanding of the phenomenon, in real terms, *Indian Village* is a must for the student of economic development.

OSCAR ORNATI

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Statistics and Econometrics

Linear Aggregation of Economic Relations. By H. THEIL. Contributions to Econ. Analysis VII. (Amsterdam: North-Holland Publishing Company. 1954. Pp. xi, 205. $5.00.)

Aggregation theory is concerned with the relations between microtheory, macrotheory and aggregation procedures. Such procedures are constructed as definitions of macrovariables in the form of functions of a specified group of microvariables. Earlier studies in this field by Klein, Shou-Shan-Pu, and May established and discussed three distinct problems: (a) to determine aggregation procedures consistent with a postulated micro- and macrotheory; (b) to specify a macrotheory consistent with a postulated microtheory and postulated aggregation procedure; (c) to determine a class of microtheories consistent with a postulated macrotheory and specified aggregation procedure. For quite a number of years aggregation theory was neglected even as a few contributions were made on special topics in input-output analysis. The present book by a Dutch econometrician revives the discussion. It should be emphasized that a further investigation of the problems in the field is certainly required, *e.g.*, existing macrotheory contains relations between macrovariables which are inconsistent with generally accepted measurement procedures of the variables involved. Such a further investigation is contained in this book, and let it be immediately stated that it is a well organized and clearly executed analysis. The author restricts his problem in two general directions: (a) he considers essentially linear models and linear aggregation, *i.e.*, the case where macrovariables appear as linear forms of microvariables, and (b) by the particular choice of procedure for deriving relations between the micro- and macrostructure of a given class of phenomena. This procedure

may be termed "statistical" to distinguish it from another possible approach. The various chapters of the book unfold the logic of the chosen procedure in a series of cases with rising degree of complexity.

After a general introduction the author discusses in three subsequent chapters three types of aggregation: aggregation over individuals, over commodities and over time. The theorems obtained indicate a close connection between the formal structure of the three types of aggregation. The essential features of Theil's analysis in these chapters can be summarized in the following way: Suppose there is postulated a set of microrelations connecting microvariables y_i with microvariables x_{jh}. Aggregation procedures are postulated: macrovariable Y is the sum (weighted or not) of the y_i and each X_j is the sum of the corresponding x_{jh} (with respect to h). Then it is postulated that the macrovariables are connected by a relation similar in form to the corresponding microrelations. The problem now is to determine relations between the parameters of the micro- and the macrostructure. For this purpose a new set of auxiliary relations is introduced, defining each of the microvariables x_{jh} as a function of all the macrovariables X_i. These relations have no economic meaning; they are introduced for "purely statistical" considerations. As a result of various substitutions and rearrangements we derive then the intercept-macroparameter as a sum of two components; the first component is the sum of the intercept-microparameters, and the second component is a multiple of the covariance between the intercept-parameters of the auxiliary regression and the slope microparameters. We obtain similarly the slope macroparameters as a sum of the average value of corresponding slope microparameters plus a term indicating a covariance adjustment, depending on the covariance between the slope-parameters of the auxiliary regression and the slope microparameters. Some important conclusions follow from this result. In general a macroparameter will depend on all the microparameters. Thus, a small macroparameter does not necessarily mean that the corresponding microparameters are small. A serious consequence of the "covariance adjustment" in the relation between micro- and macroparameters is the possibility of contradictions between micro- and macrotheories, *i.e.*, that the reaction patterns in endogenous variables relative to given changes in exogenous variables will differ in the two schemes. Further, due to the derivation by means of the auxiliary regression, the "covariance adjustment" depends on the observed values of the microvariables. This implies that the macroparameters may change in the course of time even within a constant environment of microparameters. And as long as the "covariance adjustment" does not vanish, the estimates of macroparamenters will depend on the statistical methods chosen. Considering these troublesome results it is therefore interesting to note that there exist aggregation procedures in the form of fixed-weight sums of microvariables which will eliminate the covariance adjustment. Consequently, for suitably chosen macrovariables, we find that the intercept macroparameter is just the sum of the corresponding microintercepts and the slope macroparameter just an average of corresponding slope microparameters. In Chapter 5 the author turns to a discussion of aggregating a *system* of microrelations into a *system* of macrorelations. Some of the techniques developed by the Cowles

Commission are used in the context, and this then permits an application of previously established results to this case. Given are again a microsystem, aggregation of micro- into macrovariables, and a macrosystem in a form similar to the microsystem. In a first step the reduced forms of the micro- and macrosystem are obtained. Previously established theorems can be immediately applied to these sets of reduced forms so that the parameters of the macroreduced forms become expressible in terms of sums of corresponding microreduced form parameters and some covariance adjustment. This makes the parameters of the macroreduced form dependent on the microstructure, and provided that the macrostructure is identifiable, the same property holds for every parameter of the macrosystem. Chapter 6 extends the results to a changing economy, *i.e.*, an economy with a changing number of individuals, commodities and changing microparameters. By means of a division into subperiods and an additional auxiliary relation involving the averages of the microvariables in each subperiod the former results can easily be extended, and the macrointercept and macroslope parameter appear as sums of weighted averages of certain other parameters. By a suitable choice of weighted aggregation the most troublesome features of aggregating within a changing microenvironment can be eliminated. Chapter 7 is devoted to an investigation of "perfect aggregation," which is defined in terms of absence of contradiction between micro- and macrosystems. Perfect aggregation prevails if the aggregation bias defined in terms of the covariance adjustments vanishes. There always exists a suitable choice of linear aggregation functions which will assure perfect aggregation. A concluding chapter summarizes the results and considers the relevance of aggregation analysis.

This compactly and clearly written book which exhibits a high degree of econometric craftsmanship does not clearly answer one basic question for the reader. If in any given situation, microsystem, aggregation functions and macrosystem are given, then as a result of manipulating linear systems we obtain solutions for macroparameters in terms of corresponding microparameters only. Consistency requires that these relations be satisfied. But the author uses a different approach, by means of the auxiliary regression. Thus, a more explicit justification of his procedure in terms of the auxiliary functions would provide additional information to the reader.

KARL BRUNNER

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Einführung in die Theorie der Zentralverwaltungswirtschaft. By K. PAUL HENSEL. Schriften zum Vergleich wirtschaftlicher Lenkungssysteme. (Stuttgart: Gustav Fischer. 1954. Pp. viii, 234. DM 11.50.)

Hensel's study is a first major advance in the theoretical exploration of the planning mechanism of a centrally administered economy since the controversy initiated by O. Neurath, von Mises and Max Weber got sidetracked in various attempts to calculate the prices of productive factors by means of Walras' and Cassel's systems of equations and O. Lange's later elaboration of a theoretical model of "competitive socialism." Unlike these earlier attempts at a solution of the problem of economic calculation Hensel is always conscious

of the fact that different economic systems must be understood as different forms of economic organization which have their own specific techniques and procedures for the determination of the relative importance of aims and means and hence call for different theoretical models for the analysis and interpretation of the manner in which the problems of allocation and over-all coordination of the parts into a whole find a solution.

In full recognition of the difficulties involved in any quantitative calculation *in natura* (*Naturalrechnung*) and in full command of the familiar general conceptual framework which permits us to view economic reality in terms of its technical and economic interdependence, Hensel develops a theoretical model of the planning mechanism by drawing, like Eucken before him, upon the experiences of the German war economy. But unlike Eucken he considers the problems of central economic planning as basically solvable. The model is based upon many carefully drawn distinctions the most fruitful of which is probably that between the elaboration of the plans for the various economic units, their coordination into a centrally equilibrated over-all plan, and the actual execution of the plan as well as its effective control by a central planning authority.

Whereas the execution of the plan and its control are based upon accounting prices and upon calculations in monetary units, the elaboration of the individual plans and their coordination into a central over-all plan takes place in terms of a calculation in kind, which Hensel shows is the only possible and completely adequate form of economic calculation. After having chosen the length of the planning period and having tentatively determined the requirements of direct goods in accordance with norms of consumption and the social preference scales of the central planning authority, the major task of the planning authority consists in the preparation of preliminary quantitative balances (*Mengenbilanzen*) which list the as yet tentative requirements opposite the available supplies and planned output of goods of all degrees of intermediacy. The next step is concerned with the translation of consumers goods into intermediate goods (including land and labor) by means of technical coefficients which express the technical input-output relations prevailing at the time. These technical coefficients enable the central planning authority to translate all quantitative plans for direct goods into as many quantitative balances of supplies and requirements as there are intermediate goods; in this manner it is possible to bring into the open the relative over-all scarcities of all goods in the form of deficits (or surpluses).

The totality of these quantitative balances and their respective deficits not only show the technical interdependence as well as the competing character and complementarity of all ends and means but bring to light the critical shortages of original factors of production (bottlenecks). As such these balances are the prerequisites for the final establishment of (partial) *equilibria* of all individual plans by either reducing requirements or increasing output. This adjustment in the form of an equalization of planned output and requirement can take place only in the light of a final review of the original tentative determination of the relative importance of different aims whose competing character has been made visible in the light of the technical inter-

dependence and the complementarity of all aims and means revealed by the deficits of the quantitative balances. This final decision within the planning authority takes necessarily the form of a weighing of the relative marginal importance of different objectives which must be sacrificed (or are to be attained) as a result of the necessary substitution of scarce intermediate goods (ultimately the original factors labor and land) from one use in an alternative one. Once this decision has been reached the adjustment of the quantitative balances is complete, the coordination of all individual plans (for each group of commodities and factors) emerges automatically; the position of a "general planning equilibrium" is attained; a central over-all plan has been established.

The important point is that the coordination and adjustment of the individual plans is solved beforehand within the central planning authority. The maximizing of "utility" takes place in the light of objectives of the authority. Hensel does not devote major attention to the question of the relationship between these objectives and those of individual households; however, he seems to imply that any adjustment of the plan to the wishes of individual households is incompatible (*systemfremd*) with the nature of a centrally administered economy. Inferences drawn from empirical data derived from centrally administered economies engaged in production for war and defense or for that matter rapid expansion of heavy capital goods industries may color our conclusions just as much as categories and generalizations applicable to one form of economic organization may mislead us. After all, the technical difficulties of establishing the preferences of individual households, for instance by public opinion polls, are much less formidable than the calculation of the technical coefficients involved in Hensel's translation of consumers goods into goods of different degrees of intermediacy.

It is not possible to develop this necessarily incomplete outline of the core of Hensel's positive solution in greater detail. Suffice it to add that the book concludes with a comprehensive analysis of the problem of price formation and the role of monetary calculation, both of which play an important role not in the drawing up of the plan but in connection with the effective control of its execution—particularly in connection with the central finance plan and the related function of banks as central control agencies and the establishment of various types of incentives related to the reduction of money outlays in individual production units, the avoidance of social costs (diseconomies) and the mobilization of labor in accordance with the directives of the plan.

A final part contains a useful comparative survey of the role and the method of economic calculation under conditions of decentralized market economies and centrally administered economic systems as well as a short section devoted to a penetrating survey of the evolution of the theory of economic calculation since Neurath advocated a calculation *in natura* during the second decade of the century.

The whole study is a vivid demonstration of what comparative economic analysis in terms of ideal types and models can achieve if it stays close to the nature of the case and if it steers clear of the danger of utilizing uncritically modes of thinking adequate for the analysis of one kind of economic order as well as normative prejudgments of all kinds which have nothing to

do with the problem at hand. The author's theoretical solution of the problem of economic calculation will receive valuable support in practice by the current work in the field of input-output analysis of which Hensel was apparently not aware.

K. WILLIAM KAPP

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Business Fluctuations; Prices

Regularization of Business Investment. A Conference of the Universities-National Bureau Committee for Economic Research. Edited by MELVIN DE CHAZEAU. (Princeton: Princeton University Press. 1954. Pp. xxvi, 513. $8.00.)

The present volume makes available the papers and comments presented at a two-day conference sponsored by the Universities-National Bureau Committee for Economic Research to explore what contribution private business firms might make, in their own self-interest and without collusion, to our national economic goals of sustaining high levels of income and productive employment. The conference grew out of the concern of the members of the planning committee that in the historical context of the Great Depression, the war and the fears of the postwar years, economists and the public generally had perhaps been so preoccupied with the primary responsibilities of the government for stabilizing business conditions that inadequate consideration had been given to the potential contributions private business itself might make to this objective. That something worthwhile might be accomplished outside of government along these lines was suggested by the progress business had already made in reducing seasonal instability in production and employment and by the increasingly broad and constructive view many businessmen were known to be taking of their management responsibilities. But little serious consideration, either in academic or business circles, had been given to the question of just what responsibility private enterprise could prudently accept and reasonably be expected to discharge for reducing the severity of the cyclical declines in employment and business volume. Any possible contributions of business itself to reducing cyclical instability would further reduce the basis for some of the most serious indictments of the system. There was also some feeling in the committee that to the extent feasible, such action by business itself might be needed to reduce the dependence on government action which, while promoting sustained high levels of income, might weaken our private enterprise system.[1]

The conference brought together an impressive group of academic and business economists. Viewed as a whole, the volume provides much the best informed, broadly based and penetrating analysis of this subject matter so far available. While it is inevitable that not all of the papers come up to the high standards characterizing the volume as a whole, even the thinner papers provide fresh material that must be reckoned with. Every serious student of the

[1] The introduction to the volume makes the point that "professional literature is replete with analyses of and recommendations for government action and policy, but too little attention has been given to the impact of such proposals on the functioning, let alone the strengthening, of our private enterprise system" (p. xv).

business cycle and of stabilization policy for many years to come will need to be familiar with the papers in this volume. This is true as much for the issues left unresolved and for the suggestions of gaps in our knowledge and needs for further research, as for the important positive contributions made in the papers. In this connection, special attention should be given to the editor's introduction and the excellent "appraisals" of the conference by Don Woodward, Adolph Abramson and Ruth Mack in the final section.

Because of the broad range of material and analysis involved in the central issues of the conference and the generally high quality of the individual papers, the volume will also be a valuable reference for a much broader audience than would be primarily concerned with the specific problem of stabilization policy. The numerous insights provided concerning the way in which business decisions regarding investment outlays are made, and concerning the character and impact of important noneconomic and organizational factors bearing on these decisions are particularly valuable. Melvin de Chazeau's paper, which summarizes the materials gathered in his extensive field work on the investment policies and decision-making of some 45 leading companies under the auspices of the Committee for Economic Development, is outstanding in this respect, as well as in its wise and judicious analysis of the broader subject of the conference. In the words of one of the discussants from business, this paper "reflects a familiarity with the meanings, process, and functions of the modern business concern and the private enterprise system that would be remarkable for an academic economist even if it were not as rare as it unfortunately is." This paper will surely rank with the studies of investment behavior by Ruth Mack, George Terborgh, Walter Heller, and Michael Gort, for economists concerned with corporate investment policy and industrial organization. Kent T. Healy's paper on capital investment in railroads is also especially valuable for its combination of new material, careful analysis and a rich insight into the actual decision-making processes involved. Within the framework of more orthodox considerations and therapy, Joel Dean provides a broad and penetrating analysis of the financial implications for the firm of shifts in the timing of its investments.

The volume also provides important material concerning the effects of flows of funds upon the volume of investment, and the possibility of regularizing investment through changes in the financial policies of both business firms and private financial institutions. The generally excellent discussion of these matters in the paper of Jacoby and Weston is somewhat weakened however by failure to allow for the increases in funds from operations which business firms would have enjoyed had investment expenditures in fact been stabilized, as they assume in the rest of their calculations. Albert G. Hart gives a brief but highly suggestive list of government measures to promote regularization in private investment and B. H. Higgins reviews the efforts made along these lines in other countries. Brozen takes up the impact of technological change on the time pattern of business investment along with policies to stabilize investment in the face of erratic technological development. Abramovitz points up the implications of his research into business inventory policies on the stabilization problem in stimulating fashion and Millard Hastay provides a good

brief summary of the National Bureau's research of the cyclical behavior of investment outlays. Economists interested in any of these related problems as well as those concerned with the primary issue posed for the conference itself cannot afford to overlook the valuable material and analysis in this volume.

JOHN LINTNER

Harvard University

The Great Crash, 1929. By JOHN KENNETH GALBRAITH. (Boston: Houghton Mifflin Co. 1955. Pp. ix, 212. $3.00.)

In this little book Galbraith boldly enters Error's den to do battle with one of her more innocent looking, but actually very dangerous, offspring, Complacency about a Speculative Boom in Stock Prices. Doubts about the reality of this particular beast should have been dispelled by the reaction to the Fulbright Committee hearings last March. Then, as in the 'twenties, the mere suggestion that stock prices might be going up too fast was treated as nonsense, or perhaps something even worse, both by the speculators themselves and by those leaders of business and government who confuse the prosperity of stock-market speculators with the prosperity of the whole economy. We must be profoundly grateful to Galbraith, Eccles, and the others who spoke out clearly and courageously about the dangers of the developing boom.

The Great Crash amplifies and reinforces Galbraith's testimony before the Fulbright Committee. His primary purpose, he tells us, is to recount the story of the great stock market boom of the late 'twenties and the crash which followed. This he does in a way to bring out the full drama and color of that most dramatic and colorful episode. In telling the story he also effectively points the moral: first, a boom once it has come to feed upon itself, *i.e.*, once the rise in prices has come to depend on the expectation of a further rise, is inherently unstable; and, second, a major break in the stock market is bound to have serious repercussions on business activity in general. The book is so well written and its lesson is so clearly developed that the chances are excellent it will justify the hope which its author expresses in the opening chapter:

> Since 1929 we have enacted numerous laws designed to make securities speculation more honest and, it is hoped, more readily restrained. None of these is a perfect safeguard. The signal feature of the mass escape from reality that occurred in 1929 and before—and which has characterized every previous speculative outburst from the South Sea Bubble to the Florida land boom—was that it carried Authority with it. Governments were either bemused as were the speculators or they deemed it unwise to be sane. . . . The wonder, indeed, is that since 1929 we have been spared so long. One reason, without doubt, is that the experience of 1929 burned itself so deeply into the national consciousness. It is worth hoping that a history such as this will keep bright that immunizing memory for a little longer.

The book's only weakness is in a very real sense a product of its great strength. The author becomes so absorbed in the fight with his chosen antagonist that he allows another of Error's brood, Oversimplification of Economic Processes, to escape practically unscathed.

Until the middle of the nineteen thirties depressions were generally explained in one of three ways: as part of a natural and inevitable rhythm in economic activity, as the product of stupidity and mismanagement on the part of foreigners, as the result of the collapse of a boom in stocks or real estate. In the early years of the Great Depression, Republicans generally favored the first two explanations, Democrats the third. Neither found its diagnosis of much use in devising measures to stimulate recovery. Republicans put their faith in time and the tariff, Democrats in the S.E.C. and other financial reforms. Both felt bewildered and frustrated by the ineffectiveness of these remedies.

The Democrats did, of course, try other things too, some of which turned out to be much more useful in helping to get us out of the depression. But their approach was largely a hit-or-miss sort of thing and many of them were never clear as to which measures had contributed to recovery and which had not.

We have learned a great deal in the last twenty years, thanks to the work of Keynes, Hansen, Currie, Samuelson, and others, about the causes of both depression and recovery. Galbraith refers to some of this work in his last two chapters. But the references are too brief to mean much to readers who are not already familiar with modern income and employment theory. For instance, many economists think that the leveling off of consumer demand in the late 'twenties for such major products as automobiles and houses was, through its effect on investment, quite as important a cause of the depression as the collapse of the stock-market boom. Galbraith's only reference to this phenomenon is in a footnote (p. 181)—scarcely enough to make much impression on the uninitiated reader. Most readers will, I am afraid, come away from this book with no greater understanding of what causes depressions than they might have had in 1929, or 1893, or 1837. Their overwhelming impression will be that depressions are, as the history books say, the result of "excessive" or "wild" speculation in stocks, or railroad building, or Western lands. An important element of the truth, no doubt, and one that should be re-emphasized for each succeeding generation, but scarcely the whole truth.

It is perhaps illegitimate to complain because the author of a thoroughly good book has not written another and even better book. I cannot help regretting, however, that while he was striking such a telling blow for economic sanity Galbraith let slip the opportunity to strike a blow also for economic sophistication.

ALAN SWEEZY

California Institute of Technology

Economic Fluctuations. By MAURICE W. LEE. (Homewood, Ill.: Richard D. Irwin. 1955. Pp. xviii, 633. $6.00.)

Economic Fluctuations is designed for a one-semester course for either liberal arts or business administration undergraduates. It does not presuppose too much training in economic analysis, other than what might be supplied by an adequate introductory course. Its subject matter is sufficiently varied, yet with simplified descriptions, so that it can be understood by the newcomer and also be of interest to the concentrator.

The sections cover (in the following order) the nature of economic fluctua-

tions; the history of economic fluctuations in the United States; the nature and use of the national income accounts; business cycle theories; economic stabilization; forecasting; and international economic stabilization. The stabilization chapters also include the problems of a war (or siege) economy, and a recognition that such circumstances are no longer unique events. This reader in particular was pleased to see the international aspects treated as a major part, rather than as an addendum to the theoretical section. The author is also to be commended for his frequent cautions on the gap between theory and its application and the complexities involved in any policy implementation.

For the instructor relying on this text the end of each chapter contains many good essay questions, although some would be difficult to answer without the material contained in subsequent sections.

Quite a bit of space is allocated to the Keynesian concepts, and an excellent summary discusses the instability of the consumption function. In fact, most of the major concepts associated with macroeconomics are treated quite well. Unfortunately, their integration into a coherent theory is not as successful; it is doubtful if the average student will grasp the process fully without further explanation by the instructor. The author could also improve his exposition of the equality of savings and investment.

There are other defects, some of which can be remedied quite easily by anyone selecting the book, but others would require revision in a new edition. The major structural deficiency is the placing of the historical before the theoretical sections. It would be difficult to have much of a classroom discussion of the former without first having available some analytical aids. For example, the open market operations of the '20's are discussed on page 206, but their influence on the banking system and the economy in general is not explained until pages 458-59. Similarly, the historical section has frequent references to fiscal policy, well before its cyclical effects are covered.

Although most of the theoretical summarization is satisfactory, two areas in particular could be improved: those concerned with Wicksell and the natural rate of interest, and liquidity preference. The latter should certainly be expanded, in view of its crucial role. Greater space could also be given to suppressed inflation and its control.

The book also suffers from minor lapses and errors which can easily be remedied. For example, page 392 refers to a nonexistent accompanying chart; page 478 refers to a table containing both long- and short-term rates, but only the former are given; while a reference to Fisher on page 327 could not be found.

Regrettable, too, is the repetitiveness at times of the style. Occasionally a short explanation is followed by a summary practically repeating the idea almost word for word. Or sloppy phrasing leaves the reader in doubt as to just what is meant; to illustrate, on page 486 the student would be puzzled whether the increase in the public's holding of the government debt meant the public, as stated, or the commercial banks, as is meant. Similarly, the anecdote (p. 84, fn. 1) will be lost unless it is realized that reference is being made to a least-squares curve.

However, these defects actually are merely annoying, for the text is other-

wise very acceptable. The general tone is eclectic and cautious, a quality of the book with which this reviewer is most sympathetic. The theoretical material is summarized compactly, avoiding the excessive length that make compendia of so many works. The historical and factual discussions are generally quite clear, so that the cause and effects can be readily followed, especially since the author provides so many charts and short tables. These can also serve for classroom problems, since enough are supplied to allow for divergent interpretations and policy recommendations. For this alone the busy instructor should be thankful.

EDWARD MARCUS

Brooklyn College

Money and Banking; Short-Term Credit; Consumer Finance

Quelques enseignements de l'évolution monétaire française de 1948 à 1952. By PIERRE DIETERLEN. Centre d'Études Economiques. Études et Memoires No. 19. (Paris: Librairie Armand Colin. 1954. Pp. 232. Fr. 750.)

In seeking the lessons of France's monetary developments from 1948 to 1952, Mr. Dieterlen has done a very valuable piece of research. He reviews, in the first part of the book, the theoretical prolegomena, which he exposes, however, not as a self-contained body of doctrine but rather as a framework within which he discusses, in the second part, the various phases and aspects of France's monetary developments, and, in the third part, its monetary policy. Throughout the book, he seeks in France's monetary experience the fundamental lessons and their implications for monetary policy today.

The gist of the author's observations is that, during recent years, inflation in France was attributable not so much to the government deficit, the rise in wages, and the continued large volume of fixed investment, as to speculative and precautionary motives that prompted businessmen to exploit adroitly all of these phenomena by shifting from cash into nonmoney assets—and by borrowing to acquire such assets—in anticipation of market conditions, price movements, etc. Such moves by businessmen could not always be effectively countered by monetary policy alone. In Dieterlen's opinion, the credit controls adopted in France prevented a hyperinflation at the time of their establishment in 1948 and again in 1951, but were unable to prevent, after the Korean outbreak, a greater degree of inflation in France than in other European countries—largely because of the "safety valves" that rendered these controls partially ineffective, since both the government and business, each for reasons of its own, were reluctant to accept more stringent restraint. The crucial importance of speculative and precautionary motives as the inflationary factor in contemporary France is also attested, but in a negative way, by developments in 1952 and 1953: as business sentiment and expectations became at that time less "speculative," even the combination of a persistent government deficit financed to a large extent by recourse to the banking system, of political uncertainty, of social unrest, and of course, of easy money, failed to give rise to any inflationary strains.

Institutional, political, and psychosociological forces must undoubtedly be taken into account in any realistic study of inflation in the contemporary world. Dieterlen's effort to enliven abstract economic analysis and the interpretation of monetary data with continuing reference to the "real" world is therefore to be welcomed. Yet I wonder whether, in discussing the inherent limitations on monetary policy in France, he does not take too much for granted. True enough, for reasons that are well known, monetary and fiscal policies in France are not complementary; in effect, monetary policy, in addition to its proper tasks, has also the task of offsetting the inadequacies of fiscal policy. Nevertheless, while recognizing the tremendous difficulties of monetary policy in France, the question may well be raised whether creeping inflation, however tempered it may be by periodic pauses, is as inevitable as Dieterlen seems to imply. Exception should, I believe, also be taken to some of his interpretive comments. For instance, he regards quantitative credit controls as something different from discount and open-market policy, thus confining such controls to rediscount ceilings and primary and secondary commercial-bank reserve requirements and their variations—as if discount and open-market policies were not quantitative credit control instruments par excellence. Furthermore, he seems to have somewhat greater confidence in qualitative credit controls, unaided by general monetary restraint, than appears warranted in the light of the postwar experience. Finally, his scepticism about the effects of interest rate fluctuations, even though seemingly corroborated by recent developments in France, appears unduly generalized.

Altogether, Dieterlen's book is a very valuable contribution to the recent literature on money. His theoretical framework is not only well presented, but also refreshingly full of new insights; his statistical analysis ingenious; and his discussion of policy problems illuminating. It is a most helpful book, which deserves to be studied carefully not only by those interested in France, but by anyone who wishes to keep abreast of current thinking in the field of money and banking.

M. A. Kriz

New York, N.Y.

Trends in Consumer Finance. By M. R. Neifeld. (Easton, Pa.: Mack Publishing Co. 1954. Pp. xiv, 142. $6.00.)

M. R. Neifeld's "Trends in Consumer Finance" is a comprehensive study of small loan companies, whose lending operations account for about 6 per cent of total consumer credit outstanding. The title of the book is somewhat misleading since the term "consumer finance" normally refers to the broader scope of consumer savings and credit.

Neifeld traces the development of small loan companies in the United States under the Uniform Small Loan Law. He discusses volume of loans made, repayments, receivables, charge-offs, expenses including advertising, interest charges and earnings, capitalization, and profits. Neifeld presents a typical small loan company, shows its "break-even" size and the loan-mix by size of loans. The book also covers the characteristics of small loan company borrow-

ers, the reasons for borrowing, and the security used for loans. These facts are presented in tabular and graphical form, many from 1938 through 1952, on both a national and state-by-state basis. Much of this statistical information was not available heretofore. Special compilations were prepared by state banking officials at Neifeld's request and numerous gaps were filled by careful estimating on the author's part.

This book makes a real contribution to our statistical knowledge of small loan companies and the role they play in today's society. It should serve as a valuable source of information for anyone interested in consumer lending.

DUNCAN McC. HOLTHAUSEN

Tenafly, N.J.

Money, Banking and the Financial System. By MILTON L. STOKES and CARL T. ARLT. (New York: Ronald Press. 1955. Pp. vi, 670. $6.00.)

The increasingly troublesome "book surplus" problem places a heavy responsibility on the writers of any new text, especially in the field of money and banking, to justify their action by making explicit the nature of the contribution they feel they are making to the cause of education.

In the case of the book now under review the authors maintain, quite rightly, that the chief handicap of the student of money and banking "is a tendency to forget the central theme of the subject, namely the role of money and financial institutions in the determination and fluctuation of price and income levels." Such students, they say further, "need an explicit frame of reference for understanding and relating the various aspects of an admittedly complex subject." This "frame of reference" is provided most adequately by the first four chapters of the book which give a very lucid discussion of monetary theory designed especially to "show the strategic importance of the flow of money expenditures as a determinant of price levels, income, and output." This inherently difficult material is presented in terms that should be readily grasped by any student who has had a minimum of an elementary course in economics.

This introductory section, which comprises about 15 per cent of the entire book, is followed by chapters of a more descriptive nature that cover all the topics traditionally taught in a course in money and banking. The teacher of the subject will be particularly interested in the arrangement of this material designed to make the book more flexible in use. It could very well be used for a one-semester course by omitting the sections on international economics and trade, on money markets, and the financing of investment and consumer expenditures. These topics are very often taught in separate courses anyway. On the other hand, by dealing with certain sections more intensively and by providing a moderate amount of outside reading, the text could well serve the needs of a full-year course.

For those who still believe that a student will gain a better understanding of today's problems through a study of the evolutionary development of our monetary and banking institutions, there are several good but somewhat brief historical chapters. The two on the development of monetary standards in the United States and the three on the historical development of commercial and

central banking provide a background and perspective which should make for a more intelligent study of the material that follows.

The practice of introducing certain "panoramic" chapters giving a broad outline of the subject and following these with other chapters presenting the more detailed analysis and description should enable the student to orient himself better and make his reading more fruitful.

The book is written in an easy flowing and, in spite of its dual authorship, even style which should make an especial appeal to the undergraduate student. There is a nice balance maintained between theoretical analysis and the mechanics of operation of the various institutions treated.

Wallace Wright

Iowa State College

Business Finance; Investments and Security Markets; Insurance

Investment Principles and Policy. By Ralph R. Pickett and Marshall D. Ketchum. (New York: Harper and Brothers. 1954. Pp. ix, 820. $6.00.)

This textbook is intended for college students and for investors interested in acquiring a knowledge of the basic principles of investment. The volume is well written, comprehensive in coverage, and it constitutes a useful addition to the other existing textbooks in a field that is once again receiving increasing attention by both college students and the public at large. Economists, in particular, will be gratified by the sophisticated treatment given to the study of business fluctuations and to the forecasting of business trends.

The usefulness of the book, however, is limited by the decision of the authors to refrain from discussing investments from the viewpoint of the institutional investor as distinguished from the individual investor. This is a defect not only because a substantial part of the professional students of investments are likely to find employment with the investment departments of life insurance companies, pension funds, mutual funds, etc., but especially because the operations of these institutional investors have a profound effect on the behavior of the securities markets. This was brought out emphatically at the recent hearings before the Senate Committee on Banking and Currency on the stock market which constitute an essential supplement to all existing textbooks on the subject. This omission is all the more regrettable because the book is of inordinate length. Such length is hardly necessary in a field in which the daily financial section of the newspapers, annual reports of corporations, and a flood of releases by investment houses are readily available as supplementary sources of information.

In its discussion of the instruments of finance (Part II), the book gives a more specific discussion of common stocks by industries than most other textbooks and this is all to the good. However, the short shrift given to the specific problems of the petroleum industry in the chapter on mining securities is puzzling in view of the fact that petroleum shares tend to constitute the largest proportion of the typical investment portfolio.

Werner Baer

Hunter College

Public Finance

Essays in Public Finance and Fiscal Policy. By GERHARD COLM. (New York: Oxford University Press. 1955. Pp. xvii, 367. $4.75.)

When Gerhard Colm came to the United States from Germany in 1933, he had already attained a substantial publication record dating over more than a decade, with emphasis on public finance, but with ramifications extending into such fields as international trade and sociology. His move to the United States did not interrupt his flow of writings, and articles on principles of government expenditures and taxation and upon depression fiscal policy began to appear in the American journals. His study of the distribution of tax burden by income class, made with Helen Tarasov for the Temporary National Economic Committee, was the first systematic study of this question in the United States. The war and postwar period saw increased emphasis in his writings on fiscal policy in inflationary periods, the governmental sector in the national income accounts, the national economic budget, and projections of income flows into future periods. From his early affiliation with the New School for Social Research, he moved on to various governmental agencies, including the Bureau of the Budget, and finally, the Council of Economic Advisers, where he served as chief expert in the field of public finance. When the Council was reorganized as a result of the change in administration, he left the government service to become chief economist of the National Planning Association.

In this volume of essays, seventeen of Dr Colm's articles, written between 1934 and 1953, are reproduced, together with one new essay prepared for the volume. Except for elimination of some sections involving excessive duplication, the material is reproduced in unchanged form. The primary emphasis is upon fiscal policy and economic stabilization, with eight articles on this subject. Three articles deal with national income accounts and the national economic budget, four with principles of government expenditures and taxation, and three with the general nature and role of economics and public finance. Unfortunately no material was reproduced from the study of tax burden.

The earlier essays emphasize the extent to which Colm broke away at an early date from the narrow confines of traditional public finance to study the economic effects of governmental expenditure and tax programs, and to advocate the use of fiscal policy as a deliberate instrument for gaining greater economic stability. But he was never an extreme exponent of functional finance; throughout his writings he emphasized the obstacles in the way of successful fiscal policy, together with the problems created by the conflict of the goal of economic stability with other economic goals, and the difficulties of trying to solve by fiscal policy the problems created by other disturbances in the economy. Colm was one of the first to stress the possibility of tax adjustments as an instrument of fiscal policy, in the period in which the whole emphasis was placed upon expenditure aspects. He recognized the importance of flexibility in the operation of fiscal policy, with adjustments in terms of changing conditions, and the ever-present need for evaluating policies in terms

of a dynamic, rather than a static, economy. He has likewise stressed the need for measuring, quantitatively, the various income flows and the precise effects upon them of governmental policy, and for the projection of the data into the future.

So far as the role of economists is concerned, Colm's point of view represents the opposite extreme from that of Lionel Robbins. To Colm the traditional dichotomy between goals and means is an artificial and unworkable one; the economist must consider both, and is under obligation to make policy recommendations, not merely to evaluate alternative means of reaching given goals. Deliberate intervention by the government in economic affairs is regarded as necessary, and not incompatible with the maintenance of democratic institutions. In his work with respect to various types of taxes, Colm argues that the concept of equity in taxation must be developed in terms of the particular stage of economic and political development of the country. In conformity with this thesis, he defends the corporation income tax on the basis of the argument that at present the government is essentially a partner with business firms in the conduct of economic activity, and thus is entitled to a partner's share of the profits. To many, including the reviewer, this argument is nothing more than a flimsy rationalization of the actual treatment of corporate income.

The essays clearly reveal Colm's breadth of vision and interest, and the development of his philosophy of public finance over two decades. But his ability to see the over-all picture, and to break through traditional confines of analysis exceeds the strictness of his logic. The analysis never attains a high level, and abounds with broad unsupported generalizations. His greatest contributions have been those of emphasizing the need for seeing interrelationships of the governmental and private sectors of the economy, in stimulating others to more penetrating analysis, and in popularizing, especially in government circles, the new doctrines of fiscal policy. Along these lines his contribution has been substantial, and the present book may be regarded primarily as a tribute to this feature of his work, rather than as a contribution to the subject matter of public finance. The excessive repetition which still remains, and the lack of comprehensiveness of coverage make the book of little value for classroom purposes.

JOHN F. DUE

University of Illinois

The Redistribution of Income in Postwar Britain—A Study of the Effects of the Central Government Fiscal Program in 1948-49. By ALLAN M. CARTTER. (New Haven: Yale University Press. 1955. Pp. viii, 242. $5.00.)

This book seeks to interpret the alteration by government taxing and spending of the size distribution of family incomes in what may well have been the peak year of redistribution by the Labour government. By his careful inquiry Professor Cartter has contributed to the understanding of a subject of wide interest and has advanced comparative study in the field of income distribution, building solidly upon the earlier work of a small group of econ-

omists. Using the findings of Tibor Barna and John H. Adler and others he is able to present the 1948-49 experience in the perspective of prewar British and prewar and postwar American experience.

The leading conclusions reached by the author may be briefly summarized as follows:

1. It should be noted to begin with that out of a total national income of £9.8 billion the central government collected in taxes and disposed of £4.1 billion.

2. All taxes taken together, including a special capital levy, were found to have a progressive effect, ranging from 24.5 per cent of the total of "private income" received by those in the lowest income group (under £135 of taxable income) to 106.6 per cent for those in the highest income group (£20,000 and above). (Table 12, p. 44.)

3. All central government expenditures taken together were found to be distributed regressively. The group receiving under £135 of taxable income "received" benefits equal to 92 per cent of the total "private factor income" received by the group, while those in the £20,000 and over group received benefits equal to only 10 per cent of their incomes, assuming that the indivisible benefits (military, etc.) were distributed proportionally to "net private income." (Table 17, p. 53.)

4. "The breakeven point, or the income at which the average taxpayer contributed in taxes exactly the amount which the government spent in his behalf, fell somewhere between about £550 and £650 of taxable personal income. (In terms of private income, including undistributed profits, the breakeven point was between £700 and £800.)" (P. 63.) Cartter observes that ". . . one can fairly safely conclude that about 80% of the population was on the gaining end, and at least 10% was on the losing end" (p. 120).

5. Excluding indivisible benefits, which comprised £2.4 out of the £4.1 billions expended, the breakeven point was, of course, lower, at about £225 of taxable income. This means that as far as tangible benefits to individuals are concerned only about 25 per cent of the population showed net gains over what they paid in taxes (pp. 54, 120).

6. A summary view of the extent of the total redistributive process may best be afforded by the proportion that posttax and postbenefit incomes were of pretax and prebenefit incomes. The posttax and postbenefit income total for the group having less than £125 of taxable income was 156.7 per cent of the pretax and prebenefit total of income. For the group having incomes over £20,000 the comparable percentage was 12 per cent, including the effect of the capital levy. (Table 25, p. 63.) Of the national income 13.1 per cent was "lost" by some income groups, in the sense that taxes exceeded benefits, and gained by others (p. 79).

7. Comparing the situation with 1937 Cartter found that there was slightly less inequality pretax in 1948-49 than in 1937. But, "... redistribution appears to have been greater in postwar Britain in absolute terms and relative to the national income but slightly less per pound of tax revenue raised" (p. 79).

8. In comparing the British experience with that of the United States, Cartter found that, after adjusting U.S. data to show the same governmental

functions as those performed by the British central government, "Both before and after the war the redistribution of income was substantially greater in Britain. Combining a somewhat more equal initial distribution in postwar Britain with a greater redistributive effort, we find that the distribution of final consumer income in postwar Britain was considerably less unequal than in the U.S." (pp. 91-92).

9. In addition to the immediate redistributive policies, there are long-run programs designed to reduce inequality, which Cartter examines. ". . . the expansion of environmental services and the gradual decline in large inheritances, if these are permanent features, will undoubtedly have a tendency to diminish extreme inequalities of opportunity for future generations" (p. 110). Also, it is emphasized that ". . . there is present in Britain an additional force not included in the previous estimates redistributing incomes *to* persons with large families" (p. 116).

A study of the redistribution of income requires not only considerable economic deductive analysis but also intimate knowledge of the tax and expenditure programs. Further, the study can only be as good as the basic data on income distribution, capital holdings, and consumption patterns allow. The difficulties of seeing the problem as a whole are magnified many times when the attempt is made to compare across time and across national boundaries. Because of the many difficulties confronting the researcher in this field the reader is cautioned against easy acceptance of these conclusions, particularly the comparative statements, as "facts."

Although Cartter provides in Part II of his book a seemingly exhaustive presentation of his methods, there are a number of leaps from sketchy data to complete estimates which emphasize how much individual interpretation is involved. To this reviewer the most glaring example of such "interpretation" is the easy move from a taxable income distribution to a number of other income distributions, which are then used as the basis for comparative study. One of the methods used is to "sandwich" various types of nontaxable income into taxable income brackets without making any estimates of numbers of income recipients who might be in the newly created income bracket. The result is that the income recipient column does not match up in any known way with the income columns. (See pp. 137-51.) No sources are cited for a number of income distribution tables and graphs presented throughout the book. (For example, see Figures 5 and 6 on pp. 75-76.)

While a factual study of income redistribution among income groups provides only limited insight into the qualitative change in social arrangements brought about by the modern "welfare state," such a study is basic to appreciation of the directions in which we are moving.

Robert J. Lampman

University of Washington

The Problem of the National Debt. By Edward Nevin. (Cardiff: University of Wales Press. 1954. Pp. 115. 6*s*.)

This compact little book essays two tasks: determining empirically the distribution of interest payments on the British national debt, and proposing

a reform of the debt structure to make it a more effective instrument of economic policy. Details of the empirical study will probably be welcomed by British readers, but Americans will find this section heavy going. However, Dr. Nevin finds the pattern of distribution to be similar to that of other advanced nations, so that the proposals based on his findings are of general validity and interest. For some reason, he does not present any data on distribution measured by capital value, although that would have been relevant to his subsequent discussion.

Over 20 per cent of the interest is currently paid to government agencies (including the Bank of England). Since this leads to budgetary confusion and irrationality, he recommends an end to this method of financing public services. Another 10 per cent of the interest goes to commercial banks, representing a subsidy for banking services. The author recommends that non-transferable securities be issued for bank ownership, the interest determined openly by the subsidy required for the public services they perform. The securities would have no maturity dates, but the banks would be permitted to cash them in at par after a suitable notice period, or to cash them on demand at a discount. The government might redeem these at par after giving the same notice, or on demand at a premium.

For the private owners of the debt, special issues would also be devised. Institutional investors, such as insurance companies, could continue to hold long-term marketable issues with specific maturities. For individuals, non-transferable personal certificates would be issued in small denominations, with redemption and call features similar to the bank issues. These features would protect against a mass demand for redemption.

These measures would very largely isolate each of the major sectors of debt ownership and would facilitate the exercise of monetary policy by permitting the government to deal directly with each independently. Unnecessary turnover of maturing debt would be reduced, but the liquidity of small savers and commercial banks would be safeguarded. By manipulating the terms of issue and redemption, and by exercising its option to redeem, the government could cause any sector to increase or decrease its holdings, thus affecting the money supply and/or the availability of credit to specific sectors. These proposals seem to offer much toward making the debt a functional part of financial policy in any country.

The author could have made some interesting comparisons between his proposals and similar practices actually in use--U. S. savings bonds, for instance, or the bonds issued to banks in the reorganization of the German banking system.

One regrets that the book deals only with problems of managing a debt of given size. The large questions revolving around increasing or decreasing the debt are not discussed. The author has done a good job within the limits chosen, and one laments the omission of other topics because of the feeling that they would have been well treated also.

Paul B. Trescott

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Fiscal Policy: Its Techniques and Institutional Setting. By JAMES A. MAXWELL. (New York: Henry Holt and Co. 1955. Pp. vi, 218. $2.90.)

In these tightly packed but readable pages, the author offers a realistic, extensive, and nontechnical survey of American techniques and institutions for implementing countercyclical fiscal action. Most of the arguments and conclusions may be found elsewhere in the literature—the author claims no originality in this work—but the skillful integration of political and economic ideas, research findings, description, and historical references into a swiftly developing argument is unique.

Professor Maxwell's core conclusions, developed in the first half of the book, are that discretionary fiscal action ought to be employed after a turning point has been reasonably established, and that built-in flexibility of the federal budget should be relied on as the first line of defense against recession or boom. According to the author, this arrangement is preferable to one which relies on forecasts of economic conditions, because explosive results may be obtained from unreliable forecasting and techniques of uncertain power; political delays and bias tend to negate prompt and rational discretionary action; and structural maladjustments in costs and prices are more likely to be corrected if strong fiscal action operates with a lag. To minimize the dangers of cumulative movements and the inflexibility of a rigid system of built-in stabilizers, the degree of built-in flexibility should not be too strong, but tardy discretionary action should be vigorous. These conclusions are placed in proper relationship to other aspects of policy and the institutional environment in chapters which cover a gamut of subjects from monetary policy and debt management to the work of the Council of Economic Advisers and the Joint Committee on the Economic Report.

Detailed analysis of feasible techniques to increase the degree of built-in flexibility and to implement dicretionary action is presented in the second half of the volume. The author concludes that his computations indicate that the existing degree of built-in flexibility is modest and ought to be strengthened in a number of ways, including, among others, higher per capita exemptions and steeper progression in the individual income tax, longer carry-backs of business losses, replacement of federal public assistance grants with block grants which vary countercyclically, and enlargement of federal grants for state-local construction to provide semi-automatic cyclical offsets. Concluding remarks discuss the implications for democratic liberties of shifting some or all fiscal authority from Congress to the Executive, and end on an optimistic note about present institutional arrangements.

Many exceptions which might be raised against Maxwell's conclusions are weighed in his book and require no additional comment here. But there are some issues which I find inadequately treated. Though there are illuminating references to such social goals as freedom, progress, and equity, economic efficiency tends to be suppressed, except in the discussion of wastes of unemployment and make-work schemes for elminating it. There are a number of comments, more or less related to monetary matters and debt management, which seem extreme in their unqualified form. For instance, the allegation that

short-term treasury financing at low interest rates during 1945-1951 was responsible for inflation (p. 26) is unduly controversial, and the inference that classical writers thought an addition to government spending would produce inflation at full employment (n. 17, p. 11) is surely misleading, if not erroneous.

The conclusion that countercyclical excise tax rate changes should be confined to goods with inelastic demand (pp. 195-98) is, in my opinion, erroneous. As applied to tax reduction, the argument is that tax cuts on products of elastic demand would not reduce excise collections very much, and, by lowering prices of these relieved products, would expand their use and absorb income which otherwise would have been spent on other goods. The effect would be to stimulate the favored industry largely at the expense of others. On the other hand, excise reductions on commodities of inelastic demand release income for expenditure on other goods by roughly the amount of decline in tax collections, and stimulate other industries at the expense of the Treasury. But this argument sidesteps an important consideration. The expansionary effect of an excise cut is roughly equal to the decline of tax collections, and there is *some* rate-cut which will reduce collections on goods of elastic demand —by the full amount in the limiting case of removal of the tax. Though it is true that the expansionary effect in this case directly benefits only the taxed industry and that spending on other products will be more or less reduced, the total expansionary effect on aggregate demand is not for these reasons any less than that of an equal reduction in revenues on goods for which the demand is inelastic. Moreover, excise relief for products with elastic demands should not be denied merely because the industries concerned are the chief immediate beneficiaries, for the demands for their products are often the hardest hit by a general decline in incomes.

These criticisms, however, do not weigh heavily against the many advantages of this book. It is an excellent survey for use in government finance courses, and it can be read profitably by economists in other fields who desire a brief, modern treatment of fiscal policy.

CHALLIS A. HALL, JR.

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International Economics

Problems of Economic Union. By JAMES E. MEADE. (Chicago: University of Chicago Press. 1954. Pp. ix, 102. $1.75.)

Professor Meade deals with a number of problems, international and domestic, which are involved in the establishment of an economic union. As he characterizes it, the purpose of such a union is to increase levels of living by improving economic efficiency through the creation of a large free-trade area and, perhaps, also through the creation of a large area within which the factors of production can freely move to the most productive employments. He assumes that the countries would wish to do this in a way compatible with the avoidance of booms and slumps and with the maintenance of equilibrium in their balances of payments. The implications of forming such a union for

the domestic economic policies of the countries involved are also explored. The principal conclusion is that large-scale delegation of authority on domestic as well as foreign policies by the nations concerned to the Union's central agency would be necessary to accomplish the objectives of the Union.

The brevity of the book has resulted in the elimination of both rigorous proofs for some of the arguments made and of additional actual or hypothetical examples. Fortunately, however, brevity has not caused the author to limit the scope of the problems to which he addresses himself. Meade presents a welcome objective analysis which sets this problem in a useful perspective.

Attention is first given to the problem of the creation of a single free-trade market within the Union. Using the "welfare" approach, he finds that the members of the Economic Union would have to give up all direct interferences in international trade and payments, including the less obvious protective devices such as customs procedures. Difficult as we know these foreign economic policies are to achieve in practice, Meade also points out that to meet his "welfare" criteria the achievement of the goals of the Economic Union would require important delegation of authority in major fields of domestic policies on monopolies, taxation, defense, etc.

Perhaps for purely personal reasons, the reviewer found most interesting, and would like to devote most of this review to the chapter dealing with the balance of payments, in which Meade considers the question of whether in the modern world there is any practicable alternative mechanism for adjusting balances of payments among the members of the Union other than variations in direct trade and exchange controls. Three different basic methods are discussed, namely, that of "accommodating finance," inflation or deflation, and variation in rates of exchange. The first method, which the very name explains, is regarded as unsatisfactory as a continuing device for meeting a permanent balance-of-payments problem.

The second method of inflation or deflation, as the case may warrant, is also essentially discarded. The discussion of this method is conditioned by the author's basic assumption that the members of the Union wish to avoid either booms or slumps. Meade notes that the problems of adjustment to changes in relative domestic prices would be eased by the removal of trade barriers, free movement of labor and the application of the principle of multilateralism to all monetary transfers between members of the Union. He then goes on to argue that the adjustment of trade flows to changed price relationships would be bound to take time and, in the meantime, there would be need for some accommodating finance to cover the temporary deficits in the balances of payments. Meade seems to feel that, if this method of adjustment is used, it would be best done through instituting a single currency.

The author sees great difficulties in achieving balance-of-payments equilibrium through domestic stabilization policies. The major difficulties would, however, seem to stem at least in part from the either-or method of approach. If one assumes serious problems of disequilibria in many countries, resulting from conditions of advanced inflation or deflation, it obviously becomes a matter of considerable difficulty to achieve equilibrium through changes in

domestic policies alone, or indeed, through any single line of policy. If, however, less difficult conditions are assumed to exist and/or the authorities have available a *combination* of policies, then—and I am sure Meade would agree—domestic stabilization policies become both an essential and feasible part of the program of achieving and maintaining international equilibrium.

Meade is obviously enamored of his third solution, namely, variations in exchange rates. His arguments for exchange rate changes as a means of adjusting balances of payments are quite familiar, and like many others, Meade sees their principal charm in their compatibility with the maintenance of full employment and internal balance. More interesting is his discussion of the use of "free exchange market" versus "adjustable-peg." The first method envisages a free exchange market in which the various national currencies of the countries concerned are subject to the daily or hourly fluctuations of supply and demand accompanied, perhaps, by the intervention of official exchange equalization funds. The second system is that "envisaged under the Articles of Agreement of the International Monetary Fund." According to Meade, under the latter method there are long periods in which "more or less rigid" exchange rates prevail and "then from time to time there are large once-for-all changes in exchange parities in order to restore equilibrium to disordered balances of payments" (p. 46).

Meade is an able advocate of the free exchange market. There is much with which to agree in his arguments; for example, his point that the impediments to trade due to the uncertainties of exchange rate changes are much less significant than those due to an extensive system of exchange controls and import licensing. Others of his conclusions are, perhaps, more doubtful, such as the judgment, which he seems to make, that the problem of competitive devaluation has become much less important— a conclusion which might well be suited to the decade 1945-55, but maybe not to the next decade when satisfactory levels of domestic activity may be coupled with very competitive conditions internationally. His description of the "adjustable-peg" would seem to generalize from a short period of history, particularly the widespread devaluations of 1949, which can not offer a sufficient basis for generalization. The reviewer shares the author's abhorrence of overvalued exchange rates as a cause of balance-of-payments disequilibrium. There is, however, nothing in the method of operation of the Fund which would prevent the mechanism of exchange rate adjustment envisaged thereunder being used effectively as a means of avoiding unrealistic exchange rates. The same factors which cause countries to try to maintain overvalued exchange rates may also operate to prevent the effective functioning of a free exchange market. Intervention by the monetary authorities directly in the exchange market or through limiting access to the exchange market might recreate some of the evils which Meade seems to see resulting from "adjustable-pegs." He notes that for his system of free exchange market "to work at all there must be reasonably reliable principles governing the internal monetary policy of each country. . . . If a national government fails to carry out an effective financial policy for domestic stabilization, the resulting continuing inflation of prices and incomes or the resulting uncontrolled depression will make it quite impossible for any one to judge

whether that member's exchange rate is at any time over-valued or undervalued . . . trade between countries concerned will be subject to wild uncertainties and speculation" (pp. 53-54). It is the conviction of the reviewer that under the conditions set forth for the favorable operation of the free exchange market, and assuming the removal of direct import and exchange restrictions, as is done by the author, the difficulties of successful operation of a system of exchange-rate adjustment as set forth in the International Monetary Fund Agreement becomes much easier to overcome than is suggested by Meade. Both systems are undermined by inflationary domestic policies; both systems become much more manageable under conditions of domestic stability. When domestic stability and international equilibrium (without direct restrictions) have become the rule for some time, we will be in a better position to judge the merits of this controversy of "free exchange market" vs. "adjustable-peg."

Meade also has an interesting chapter as to whether the formation of a single integrated market for products is sufficient to ensure the use of the resources of the group of countries forming the Union in the most efficient manner or whether these countries must also allow their resources of capital and manpower to move freely from country to country in search of the most productive employment. The author summarizes, as the basis for his analysis, Samuelson's arguments as to why under certain conditions freedom of trade and products will suffice. He analyzes what he regards as some of Samuelson's assumptions in order to demonstrate why freedom of trade would not be sufficient in practice. He gives six reasons for his conclusion, namely, differences among member countries in productive atmosphere and in the scale of production; transportation costs; the complete specialization of certain regions on certain lines of production; the existence of a large number of factors relative to the number of standardized traded products; and marked differences in the technical possibility of substituting one factor for another in the different industries producing traded products. These arguments are, of course, limited to the movement of labor, but Meade notes that a similar analysis could be used to demonstrate the need for the movements of capital from capital-rich to capital-poor regions of the Union. He realistically sees and discusses some of the difficulties in achieving the movement of free labor and capital. In effect, it would mean, for example, that member states would have to keep in step in their policies for the distribution of income.

Even this brief summary of Meade's arguments should demonstrate what is perhaps the most important conclusion to be drawn from the book, namely, the far-reaching character and thorough-going nature of a real economic union. It will help avoid the confusion of regarding the transfer to some supranational or international body of one or two precisely defined economic functions as the same thing as the formation of an economic union. In view of the practical difficulties involved, Meade writes that he does not see the possibility of achieving a real economic union between important countries by a single constitutional change, but that he would rather be inclined to advocate the development of the institutions which are already at hand. It may be noted that the preconditions for the achievement of economic union by coun-

tries which are willing to make the necessary political decisions to achieve the advantages of this step, are made easier by further progress in international economic, financial and monetary cooperation. Through such general cooperation countries not only begin to create those economic preconditions which might facilitate the formation of economic unions, but also begin to learn the hard process of adjusting national economic policies to internationally agreed standards and procedures.

IRVING S. FRIEDMAN

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International Trade Under Flexible Exchange Rates. By JOHN BURR WILLIAMS. (Amsterdam: North-Holland Publishing Co. 1954. Pp. xiv, 332. $5.00.)

This book, though it claims to present a "new theory" of international trade, actually works for the most part within traditional confines. Its novelty lies in its concentration upon the short run, and in its rejection of multiplier theory as the main tool of short-run analysis. Williams' theory is based on the notion that supply curves for individual commodities are fixed in the short run in money terms, and on a simple version of the quantity theory of money which holds that aggregate spending will change only in response to changes in the quantity of money. The volume of spending, however, is assumed to affect the level of economic activity rather than the level of prices, the general price level being tied to the level of wages, which is assumed to be fixed in the short run. Interest rates are assumed to be determined in the market for new issues of securities, and savings are assumed to find their way into real investment through the market for new securities (p. 165). Hence increases in the desire to save within a country are reflected in interest rates and investment; not in aggregate demand or unemployment. Likewise, changes in the desire to purchase foreign securities are reflected in interest rates and exchange rates; not in aggregate demand or unemployment.

Within this system, where by assumption economic activity is uniquely linked to the quantity of money, it should be no surprise that neither reparations nor exchange manipulation nor private foreign investment will alter the level of economic activity unless at the same time the quantity of money is changed.

Williams relegates consideration of changes in spending to a single chapter of fifteen pages. If payment of reparations is financed by new bank credit, the paying country will experience a rise in economic activity, but this rise will be due to the monetary expansion, not to the transfer itself, as Williams defines it. Under a common currency, as between regions of a country or between nations on a pure-specie gold standard, the transfer of reparations is accompanied by changes in the quantity of money, and the familiar process of inflation in the receiving area and deflation in the paying area brings about the real transfer of goods and services. Here, and only here, is there a direct connection between a transfer and changes in employment. Other cases, involving special assumptions about the policies of monetary authorities, though discussed by Williams, play a distinctly subsidiary role in his analysis.

Williams is the prisoner of his assumptions, and they are not very sophisticated. Yet his analysis serves to remind one of important propositions in the theory of flexible exchange rates, and to make one wonder whether we have not been led, by treating fixed exchanges as the typical if not the general case, to have monetary expansion and contraction buried in our assumptions and never brought to the surface, when really such movements may be crucial to our conclusions.

The book should get one plus and one minus on matters of exposition. Williams relies heavily on complicated systems of graphs rather than on verbal or mathematical analysis, and constant reference to his charts became tedious to this reader. On the other hand the style is lucid and highly readable, and scattered through the pages are apt references to recent experience and pithy, almost aphoristic judgments on matters of wide interest. Let me illustrate and close by quoting Williams' comments on the International Monetary Fund:

> An International Monetary Fund to help stabilize exchange rates has been widely advocated, and one is now in operation. One of its functions is to set fixed rates of exchange, and then revise them from time to time, but only at long intervals and in the face of obvious necessity. The effect is to make the rate change suddenly and in big jumps instead of slowly and little by little. Is this what we really want? The big jumps come far apart, to be sure, but the very size of the jumps in rates may well do more harm than any amount of slow continuous drifting of the rates. The advocates of steady rates say it is hard to close a business deal if rates are rising or falling, even though slowly; but it is even harder to close a deal if rates, though steady today, threaten to jump a long way tomorrow. Since the risk in foreign exchange can be avoided without resort to fixed rates, nothing is to be gained by fixing them as the Fund does. . . . If [a pegged] rate breaks down, it can move only in one direction, and foreign traders are seldom in doubt as to which direction this is. Consequently, whenever they cannot hedge their holdings of foreign exchange, . . . one party to the trade knows that he stands a chance of suffering a serious loss, with no chance of making an offsetting gain. In a free market, however, . . . both parties to a trade feel that their chance of gain is equal to their chance of loss. Likewise, they feel that any fluctuation that does occur is likely to be small. With a pegged rate of exchange, on the other hand, any fluctuation that does occur is likely to be large, with the result that one party to the trade may suffer a crippling loss. For this reason foreign traders do not like a pegged rate (pp. 238-39).

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Business Administration

Productivity Accounting. By HIRAM S. DAVIS. (Philadelphia: University of Pennsylvania Press. 1955. Pp. xii, 194. $5.00.)

This book, by an industrial economist who is the director of the Department of Industrial Research, Wharton School of Finance and Commerce of the

University of Pennsylvania, is not so much a work on accounting as it is a description of a statistical technique for measuring the productivity of an enterprise. As the author himself states, "the only justification for giving the name 'productivity accounting' to the method proposed in this book is that it is grounded on basic accounts of a firm, and like usual business accounting deals with all inputs, although in an economic rather than in a financial sense."

The measure proposed is the ratio of total output during an accounting period to the total economic costs incurred to produce that output. Both output and cost are restated in terms of constant prices. The method pursued is to analyze in great detail the financial statements of an actual business, disguised sufficiently to conceal the firm's identity but still reflecting the results of its accounting process as conventionally followed. An illustrative application to this firm of "productivity accounting" is presented first; then follows a lengthy discussion of the theoretical and practical difficulties involved, after which various uses of the calculations are presented. These uses are grouped under five main headings, namely, (1) as a measure of the efficiency of a firm as a whole, (2) as one means of analyzing past performance, (3) as part of the budget control of current performance, (4) as a means of preparing common-price financial statements, and (5) as a device to measure the initial distribution of the benefits flowing from a change in productivity.

Productivity is broadly defined as the "change in results obtained for the resources expended," and consequently includes shifts in the output-input ratio resulting from (a) changes in the production process, (b) changes in methods of using existing processes, (c) changes in the "mix" of input or output, and (d) changes in both the rate and scale at which existing processes are utilized. Specifically, the financial statements of a "given" year are compared with those of a "base" year by restating the recorded dollar amounts of output and input in the given year in terms of base-year prices. The ratio of output per dollar of input for each year is then calculated. The change in the ratio between years is the measure of the change in productivity. This procedure can obviously be extended to the data for a series of years or to a comparison of budgeted with actual figures.

The classification of output follows the familiar accounting and statistical categories of types of product, *e.g.*, commercial grades of rubber, textiles, etc. Input is composed of (1) labor and management, (2) materials, (3) supplies and business services, (4) capital goods (depreciation), and (5) investor input. Each of these categories can be subclassified in specific cases, or analyzed separately, depending upon the objective of the analysis.

The author recognizes clearly that revaluation of output and input in terms of constant prices (*i.e.*, the actual prices prevailing in some base period) means a rating of the component items in terms of their market importance in the base period. As a consequence, the measure of productivity change he obtains is a measure of the change of output per unit of input "in terms of the existing value system under which the production occurs."

This book is excellent for those who wish to use accounting data as grist

for a statistical mill whose output is data on productivity in industry. The practical and theoretical problems are certainly completely catalogued, and, for the most part, satisfactorily handled. What the author never makes entirely clear is why any business management should prefer a change in productivity to a change in profit as a signal to speed up or slow down. Perhaps the increased use of electronic computers in business will enable management to obtain both kinds of data so that a choice between them will not have to be made.

MAURICE MOONITZ

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Les commerces de détail en Europe occidentale—Essai de comparaison internationale de la productivité des magasins et du travail commercial. By JEAN-MARCEL JEANNENEY. (Paris: Armand Colin. 1954. Pp. 73. Fr. 300.)

This study of *Western European Retailing—International Comparison of the Productivity of Retail Outlets and their Personnel* is the first publication of the "Service for the Study of Economic Activity and Social Conditions," an institute created in 1952 by the "National Political Science Foundation" and directed by the author, Professor Jean-Marcel Jeanneney of the Paris Law School.

Using measuring techniques developed by the U.S. Bureau of Labor Statistics and adapted to the distributive trade by the Organization for European Economic Co-operation, Jeanneney attempts a comparative evaluation of retailing productivity in eleven European countries.

With a view to detecting the probable causes of mediocre retailing productivity, the author analyzes eight ratios: the number of food stores, the number of other retail outlets, the number of their respective employees, in terms of population, and annual sales volume.

Great differences in retailing productivity are indicated by the various ratios. If equal weight is assigned to them all, the eleven countries rank, in descending order of productivity, as follows: Sweden, Switzerland and Italy, Denmark and Norway, Great Britain and Germany, France and Austria, the Netherlands, Belgium.

Several attempts are made to explain the differences. Does retailing productivity depend upon geographic factors, such as density of population or degree of urbanization; or upon economic factors, such as the ratio of farmers to total population or the use of industrial power? The only close relationship indicated by the measurements links less-than-optimum retailing productivity to a low standard of living and, particularly, to a low wage structure. Legislation restricting the establishment of new retail outlets, of course, protects inefficient operation.

Despite admitted limitations of the statistical techniques used, this first attempt at determining the productivity of distribution appears extremely interesting. While much remains to be done, the experiment explores a new, difficult, and highly important field. Similar studies should be undertaken of the productivity of wholesaling finished products, and of the productivity of

the process whereby raw materials, component parts, and other producers' goods are marketed in industry. If it is true that productivity of the over-all distribution process depends primarily upon its accurate synchronization with the accrual rate of consumer demand, then studies of this type should be valuable in spotlighting areas in need of improvement, and in facilitating remedial action.

ERIC D. BOVET

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Industrial Organization; Public Regulation of Business

Grossindustrie und Gesellschaftsordnung. Industrielle und Politische Dynamik. By HERBERT VON BECKERATH. (Tübingen: J. C. B. Mohr (Paul Siebeck). Zürich: Polygraphischer Verlag AG. 1954. Pp. xii, 278. DM 19.60.)

The dominance of the large enterprise in industry has attracted much attention for many decades. Of economists it can perhaps be said that the large industrial enterprise has been a center of attention for those concerned with economic history and organization, with labor problems, with reformism and socialism, and with such concrete issues of public policy as the maintenance of competition. Economic theorists on the other hand have dealt with big business only recently and with some awkwardness and discomfort. Much the same can be said of those economists who have discussed general economic policy at high levels of abstraction. In his new book Herbert von Beckerath sets for himself a comprehensive problem, that of the meaning and consequences of modern large-scale industry for social structure and development, for the economy as a whole, for politics, and for public policy.

Part one of the book, which is introductory, announces the limitation of the scope to large enterprises in the manufacturing industries. Inasmuch as the author essays evaluations of the political and social aspects and consequences of big business, this indeed must be counted as a shortcoming. Big business is more than big manufacturing, and in the United States particularly, the large nonmanufacturing enterprises, being predominantly private, present public policy issues different from those which have existed in Europe. Large corporations in such fields as banking, insurance, transportation, and communication receive scarcely a mention from von Beckerath; unions are viewed only in the light of their relations to and effects upon the manufacturing industries.

Parts two and three give a sketch of the history of industry in western countries since 1875. Parts four and five are devoted to general descriptive materials on business organization and management, raw materials supplies, sources of capital, labor markets, and product markets. Part six is on public policy and the large enterprise. Here the breadth of Beckerath's knowledge and interests gives the reader interesting contrasts and comparisons among the countries of the West and among general types of economic policy. But here, as throughout, his treatment of each topic is brief, and in parts, superficial.

Because international comparative analysis of the relations among society, state, and industry has not often been undertaken, von Beckerath's comprehensive view is valuable for its insights. He is in a position, as few have really

been, to view in long and in minimally distorted perspective the political economies of both sides of the Atlantic. The contrast between the effects of public policy on the structure of industry in America and Western Europe he handles well. Likewise, the author's characterization of the main types of economic policies, with their political and philosophical orientations, is skillful in the light of his purposes. Beckerath's own point of view can perhaps best be described as conservative in the sense in which that term has appeared in recent political literature in this country. Public policy, he believes, faces the task of preserving and increasing the contribution of large industrial enterprises to economic progress, while maintaining freedom (especially that of the superior people), and at the same time following the dictates imposed by the politics of the age, namely, those of economic stability and the defense of western civilization.

This is not a book to recommend to the specialist, except that some might find in the many references to the French and German literature a source of help. The work is intended as a text and for the general reader. For this purpose its breadth, judicious tone, and its very brevity should make it valuable.

D. S. WATSON

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Public Utilities; Transportation: Communications

Transportation and Communications. By G. LLOYD WILSON. (New York: Appleton-Century-Crofts. 1954. Pp. xi, 757. $6.00.)

The transportation industry, despite its great age and maturity in many respects, is still growing and changing, so that a new textbook is imperative every few years. Therefore, this book, by the chairman of the transportation and public utilities department of the Wharton School of the University of Pennsylvania, is a timely arrival. Since transportation textbooks are essentially factual presentations of the transport industry—its history, facilities, practices, and problems—they cannot differ radically in content, and must be judged on the basis of clarity, logic of arrangement, and relative emphasis.

Those well acquainted with the field of transportation will immediately recognize in this book a strong family resemblance to the long-popular Johnson, Huebner, and Wilson text *Transportation—Economic Principles and Practices*. The general arrangement is the same; what might be termed the *vertical* approach, that is, each of the various means of transport is considered separately in all its aspects. Other texts may follow the alternative approach of taking up various functional aspects of transport, such as rates, regulation, etc., and considering each of these with reference to all forms of transport. This too has its advantages, but many of these texts, and especially those which have tried to combine both approaches, have frequently bogged down in confusion and repetition.

A unique feature of this book is the inclusion of five chapters on the communications industry--telephone, telegraph, and radio. This is an area, closely related to transportation, which is all too often entirely neglected in college curricula in business administration.

One criticism of this book is its occasional lapse in presentation of the latest statistical data available. For example, in one of the introductory chapters, a table giving the distribution of freight and passenger traffic among the various agencies of transport uses 1939 figures, although later in the book there is a discussion of the relative shares in 1952. In the chapter on passenger service, reference is made to the federal transportation tax as 15 per cent, but seven pages later the reduction of this tax in 1954 to 10 per cent is recorded (though a typographical error makes the date 1944). Slips like these, while annoying, are not too serious, since they are few and any competent instructor can make the necessary corrections.

The important fact about this book is that it is eminently teachable. Instructors who wish to rely heavily upon a text will find that it contains ample material for a semester course, while those who prefer to create their own course will find the book an excellent framework upon which to hang their own material. It will serve equally well as a text for the only course in transportation, or for a basic course which is to be followed by advanced courses on specialized areas of transport.

Although transportation is a subject in which it is very difficult if not impossible to divorce the theoretical from the practical, it should be pointed out that the emphasis in this text is somewhat heavier upon the practical approach. For instance, in the discussion of railroad rates there is slightly more emphasis upon *what* rates are than upon *why* they are what they are; and in regulation more space is devoted to the provisions of the regulatory laws than to the philosophy of utility regulation. In short, the author has evidently tried to describe what the *user* of transport needs to know about the American transportation system.

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Industry Studies

The New England Fishing Industry—A Study in Price and Wage Setting. By Donald J. White. (Cambridge: Harvard University Press. 1954. Pp. xvii, 205. $4.00.)

Apart from a few dedicated souls in government agencies, professional economists have shown remarkably little interest in the fishing industry. Yet its history of bitter internal disputes and repeated antitrust actions provides ample evidence of the need for analysis of both market structure and market performance. Dr. White has undertaken this task with respect to the important fresh and frozen sector of the New England fisheries centered in Massachusetts and Maine. Though the analysis is centered on the seriously disruptive conflicts among fishermen, vessel owners, and buyers, it is prefaced by a concise summary of the basic structure of the New England dockside markets and concludes with a series of specific policy recommendations.

The author is obviously thoroughly familiar with the technical and organizational background of the New England fisheries, and his delineation of the proximate sources of their troubles—the interrelationship of prices and labor

compensation through the lay payment device; the pressure of declining fish populations; and the mounting volume of imports—is convincing.

Nevertheless, while this is a useful book of professional calibre, it fails to develop the interrelationship of market structure, behavior, and performance in the precise manner characteristic of the many excellent industry studies produced in what might be termed the Harvard tradition.[1] For example, there is no analysis of the degree of concentration among waterfront buyers or of the possibility that coordinated purchasing policies could develop and persist without overt collusion. This is vital to an understanding of continued conflict among dealers and fishermen, since—contrary to White's assumptions—the supply function of primary producers in the fisheries is typically inelastic to price decreases in both short and long run.

Perhaps because of the brevity of the book, a number of its conclusions are inadequately supported. There are, for example, better reasons for rejecting a price support program in the fisheries than that it would result in "putting the union at the mercy of the government" or "undermining the New England industry's will to self-improvement." And the implication that marketing margins are excessive is supported only by the fact that they are high.

White's recommendations with respect to the futility of import restrictions, the need for basic research on both biological and economic fronts, and the desirability of expanding and stabilizing the demand for seafoods are sound. But the key question of the establishment of orderly and competitive pricing procedures at dockside will not be resolved by his suggested changes in the mechanics of pricing, though they are sound. Until the bases for recognized interdependence of buyer purchasing policies are eliminated the turmoil on the waterfront is likely to continue; and this is hardly touched upon in the book.

James A. Crutchfield

University of Washington

Land Economics; Agricultural Economics; Economic Geography

World Population and World Food Supplies. By Sir E. John Russell. (London: George Allen & Unwin Ltd. 1954. New York: Macmillan. 1955. Pp. 513. $8.50.)

The central purpose of this work is apparently to survey the nations of the world with respect to "what each is doing to increase its contributions to the world food market or to reduce its dependence thereon" (p. 6). The method is to show, by analysis of the history of current practices in agricultural organization and technique in each of several countries, those roads to enhanced food output which may be followed in others somewhat similarly situated especially as to climate and soils. Attention is consistently directed to the successive gaps between "freak" yields, achievement under experimental conditions, outputs of the best farms, and results obtained by average and inferior producers. Ways and means of agricultural improvement and development being the main subject matter, the volume has particular interest for readers concerned with problems of underdeveloped areas. There is a wealth of specific information,

[1] For example, the works of Bain, Markham, Steiner, Alhadeff.

pertaining to specific places, on current practice *vs.* scientific knowledge about irrigation, land reclamation, water conservation, correction of soil deficiencies, use of fertilizers and insecticides, soil and pasture management, plant and animal breeding.

Consideration of the gaps between practice and knowledge in agriculture leads Russell to conclude (p. 7), "the picture that finally emerges is one of tempered optimism." He holds higher expectations of improved food supply for advanced countries than for the underdeveloped ones, for temperate zones than for tropical, for South American tropics than for the African and Asiatic. On food imports for the United Kingdom, he thinks (p. 495) "we may feel hopeful about bread grains, margarine, milk, bacon, pork, and mutton at present levels of consumption, also sugar, fruit, and vegetables. But we cannot rely on pre-war supplies of butter or of beef however much we may hope for them." As for the less advanced countries, he believes (p. 7) that "all can, if they will, find a basis for cooperation with the countries that can supply them [with appliances lacking domestically but needed for improvement of their agriculture] and provide experts teaching how to use them." Apparently his expectations for the underdeveloped areas would be higher if political leaders in those parts of the world showed more evidence of hospitality to capital imports and foreign experts than they do.

Such conclusions indicate that Russell is not greatly troubled by "the population problem," perhaps in part because he restricts his probing of the future to "our time" and says nothing about matters indefinitely remote. He speaks, it is true, in favor of a "sound population policy" for the less advanced countries, India in particular; but the point is made briefly and casually, and what such a policy might be or how implemented receives no discussion at all

The book is somewhat narrower in scope than its title suggests. Excluded from more than passing mention are the USSR and satellite countries, Western Germany, Austria, Switzerland, Greece, Morocco, Algeria, Tunis, Libya, Ethiopia, Turkey, Arabia, Iran, Mexico and Central America, the Caribbean islands, the Philippines, and a few others. Considering the purpose of giving illustrations of roads to agricultural improvement, omission of Turkey and Greece appears especially regrettable. There is a brief, somewhat perfunctory, introductory chapter on world population numbers and growth, and a longer concluding chapter on trends in world food supplies especially as they bear upon prospects for British food imports. Otherwise the treatment is by geographical areas *seriatim:* British Isles (54 pages); Netherlands, Denmark, Sweden, Finland (54 pages); France, Spain, Portugal, Italy, Israel, Egypt (50 pages); Africa south of the Sahara (135 pages); India and Pakistan (27 pages); China, Japan, Indonesia, Burma, Thailand, Indochina (9 pages); the United States and Canada (46 pages); Australia and New Zealand (47 pages); and Argentina, Brazil, Uruguay, and Paraguay (22 pages). Opinions will differ on the relative merits of the regional analysis. The present reviewer happened to derive least satisfaction from the discussions of Asiatic countries, Spain and Portugal, the United States, and South America; most from the discussions of Israel, Egypt, Africa below the Sahara, Australia, Finland, and Canada.

Although publication was in 1954, the author usually found himself unable to present statistical contrasts of prewar circumstances (acreage, production, consumption, land use, etc.) with circumstances in postwar years later than 1950, sometimes 1951. Commonly the crops of 1952, 1953, and 1954 were far larger, so that in not a few countries where the earlier data suggested deterioration of yield and lower consumption, later information suggests the reverse. Writing today, Russell might well find less reason to temper the optimism of his conclusions than he found two years ago.

M. K. BENNETT

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Labor

Labor-Management Relations in Illini City. By W. E. CHALMERS, MARGARET K. CHANDLER, L. L. MCQUITTY, ROSS STAGNER, DONALD E. WRAY, and MILTON DERBER. Vol. 1: *The Case Studies.* Vol. 2: *Explorations in Comparative Analysis.* (Champaign: Institute of Labor and Industrial Relations, Univ. of Illinois. 1953, 1954. Pp. xlii, 809; x, 662. 2 vols., $15.00; each $10.00.)

Economic books should be accurate and thorough, but, once ready or approximately so, they should be rushed on the market. The reasons were suggested years ago by Richard T. Ely in defense of his own policy of prompt publication. They are, essentially: that the world has great need of all the enlightenment that can be offered in this field; that the product is highly perishable; and that some other chap may beat you to the draw. The present study, after the manner of elephants, has had a long period of gestation. The interviews and research upon which it is based covered the three years from 1948 to 1950, inclusive; the first volume, which is primarily a case-book, is dated "1953," but it had to stand by until its somewhat less hefty brother could appear at its side late in 1954; and now both are being reviewed in 1955. We cannot at this distance know all the difficulties, mechanical, controversial, and otherwise, that may have been encountered. Certainly, there has been no undue economy of time or space, or of thought and effort. The authors may well declare that they are writing for the future and not merely about the past.

This is an example of cooperative research and analysis among the social sciences; and not the least interesting feature for the profession itself is the brief account toward the very end by Chalmers of how it worked. The three disciplines immediately concerned were economics, sociology, and psychology, with political science on the side-lines. We are told that the participants first had to educate one another, and this may have been part of the time-consuming process which would not have been so necessary in olden days when an academic chair was more in the nature of a settee. We are not told which one of the triumvirate finally ruled the roost; but, judging from the fondness throughout for certain modes of expression, the emphasis upon methodology, and the use of such mouth-filling terms as "accommodation," "quantification," "circular influence," and "norms," it appears that it was not the economists,

and may have been the sociologists or their near relatives, the institutionalists. Yet there can be no doubt but that labor relations offer scope for all methods and viewpoints, and that such a newer synthesis or integration is highly desirable. We have Sir John Clapham's authority for saying that "it is at the overlapping margins of disciplines and sciences that the most important discoveries are usually made."

Some disappointment may be felt that we are given so much information about industrial affairs in an unidentified city of 50,000 or upwards, and that the names of companies, labor leaders, and historical characters are so carefully concealed. But perhaps we have become somewhat accustomed to such anonymity through parallel studies like "Middletown," "Yankee City," Steeltown" and others, which are sometimes here referred to, and can understand that confidentialness is the price that must be paid for freedom of expression and fullness of data upon a live, current situation.

The end-purpose of the study was to arrive at certain positive criteria or scales for measuring labor-management relations within a given community, industry or plant, whether they are to be regarded as good, fair, or poor; to determine the principal factors or influences bringing them about; and to show how the different features or variables are correlated. The community chosen is a medium-sized city in the Middle West with a considerable variety of industries but a relatively homogeneous population with respect to race and culture. It is fairly typical of its area but not necessarily of all areas. The industries selected for special investigation were five in number, in three cases represented by two different establishments or concerns each: a grain-processing company with quite a long history; a plumbing-supply or metal products plant; building construction firms; garment factories making house-dresses and employing chiefly women; and the local and over-the-road trucking business—making eight different units in all.

The goals or tests as to the level of success achieved in each industry and establishment are mainly three: (1) the present economic status of the workers as shown in average hourly pay and annual earnings; (2) the extent of union influence as shown by participation in the decision-making process on various phases of the business (wages, hours, accidents, seniority, time study, etc.); and (3) the attitudinal climate as registered in the frequency and bitterness of conflict or the existence of a spirit of cooperation between employers and employees. Among the determinants of successful industrial relations are given such factors as the attitude of the community toward unionism at different periods and the extent to which union leaders are represented in civic affairs; the influence of national psychology and legislation under the New Deal; the baneful effect of absentee ownership as contrasted with a neighborhood feeling; regional as compared with local leadership of labor; the change from the paternalistic or the captain-of-industry to the more professional type of management; the importance of business prosperity; the proportion which labor cost bears to total cost, and so on.

Perhaps the least revelatory portion of the analysis in Volume II is that on the "determinants" in Chapters 8 and 9, where so many of the hypotheses

as to what makes for greater or smaller union influence or for improvements in economic status seem axiomatic and not really necessary of proof. It is true that in our classes we often shape up hypothetical questions the answers to which are already known, just as an exercise for the students. But it seems rather unprofitable in a scientific treatise to devote pages to demonstrating that hourly wages tend to be higher where the regularity of employment is low, or that "If the skill level is higher, the hourly earnings tend to be higher." Adam Smith said most of these things in 1776 and no one has ever seriously disputed them, always remembering to add, "other things being equal."

It is much too late to give advice as to how the avoirdupois of this treatise could have been reduced. That would seem to have been eminently desirable both from the standpoint of publishing costs and for the comfort of the reader. The plan of treatment may be what is commonly called a spiral one or the method of approximations. But surely we are conscious of returning again and again, as in a nightmare, to the same material stated in almost identical language. Summaries and conclusions at the end of each chapter and division, and at the end of Volume II, are so frequent and complete that any passenger who dropped off at a way-station to get a sandwich or a newspaper would have no difficulty in jumping on again when the last car came by. In fact, it might be just as well to begin with Milton Derber's "Summary of Findings" in chapter 16 where there are ample cross-references to all previous discussions of each topic, and then "proceed backward" from there.

WARREN B. CATLIN

Bowdoin College

The French Labor Movement. By VAL R. LORWIN. (Cambridge: Harvard University Press. 1955. Pp. xix, 346. $6.00.)

This reviewer heartily hopes that the many persons now engaged in comparative labor studies will use Professor Lorwin's *The French Labor Movement* as a model of organization and balanced presentation. Few American writers, of course, will bring to such a study the long familiarity that Lorwin has with his subject. The French labor movement has been in the Lorwin family for a long time. Val Lorwin's father, Lewis L. Lorwin, published his *Syndicalism in France* forty years ago.

The first half of this book is devoted to describing the rise of French unionism, a product of the unique social history of that land, its syndicalist origin and its later capture by the Communists. It was, ironically, the individualism of the French workers who refused to give either funds or authority to their union leaders that kept their organization weak, thus easy prey for the well-disciplined Communists who moved in at the time of liberation.

Lorwin describes how the bright hopes that French labor held at the war's end have been dashed, the Communists in control using the major federation, the Confédération Générale du Travail, to further Soviet policy and in disregard of the interests of labor and the French economy as a whole. Yet even the CFTC, the Christian Federation, and the *Force Ouvrière,* the group that broke from the CGT—both of them closer to the more immediate objectives of the

concrete wage earner, not the abstract "proletarian"—have been unable to rally the kind of day-to-day support a trade union movement needs for growth and effective action.

Although the Communists are in control of the apparatus of the CGT, they are no more successful than their predecessors or their rivals in mobilizing the membership for their own objectives.

That collective bargaining as Americans know it hardly exists in France is brought out in the second half of the book, where industrial relations and the role of government in labor affairs are described. The well-organized employers, who view their markets as inelastic, determine the area and scope of such bargaining as exists. The competition among the federations and the apathy of the workers make this task easy.

As long as the major segment of the French labor movement continues to treat "bourgeois" government as its principal enemy, it will go on depriving itself of the alternate, governmental route for an amelioration of the workingmen's condition of life as well as for upbuilding the bargaining power of its unions.

This excellently written book has added usefulness for the teacher and student because of its complete bibliography, chronology, and appendixes.

EDWIN YOUNG

University of Wisconsin

The Union and the Coal Industry. By MORTON S. BARATZ. (New Haven: Yale University Press. 1955. Pp. xvii, 170. $3.75.)

The first three chapters of this book present a description of the market structure of the coal industry and of its most important producing area (Appalachian Region) followed by a historical review of "significant developments" of the sixty years closing in 1950. Chapters 4 and 5 are outlines of "policy objectives" of the United Mine Workers, and of the "political aspects" of union action in its internal operation, as well as in its management-government relations. The last four chapters deal with the effects of union activity upon wages and market competition (both interregional and interfuel) with a concluding appraisal of these effects.

The long first chapter furnishes the foundation. It is an old familiar framework consisting of two elements—one is the view that "a distinguishing characteristic of the industry is the vigor of price competition among many firms," and the other, that "union-enforced 'floors' . . . have curbed the use of wage cutting as an instrument of competition." The view of the industry as an almost perfect example of "pure competition" (p. 27) may have been an acceptable basis for Lubin's[1] study of collective bargaining in the 'twenties, but Parker[2] recognized its oversimplified character in 1939-1940. The "pure competition" view was never more than symbolically correct, and it became seriously defective after 1941 when unionism encompassed the steel companies' "captive mines." No mention of the significance of standardization of wage

[1] I. Lubin, *Miners' Wages and the Cost of Coal* (New York, 1924).

[2] G. L. Parker, *The Coal Industry* (Washington, 1940).

scales in this market-sheltered segment of the industry occurs in the first chapter, but later efforts to repair the defect constitute the most original contributions of the study. Had some of these been supported by convincingly presented fresh evidence, they might have counted as strokes of real craftsmanship. Unfortunately these efforts to deal with consumer-owned tonnage come too late to do more than introduce mere fragmentary bits of rare materials into a framework of pure competition where they have no place (pp. 28, 30, note 7, 37-38, 80, 82 and 141). Not only do the materials fit the structural layout very badly, but they also show marks of inept handling. Thus in considering the union-reduced working time of 1949, the author writes, "This was an attractive proposition to many firms, but it was resisted strenuously *by the captive mines—all of which could sell a full week's output* (p. 141, reviewer's italics). If we skip the very real question of whether it is appropriate to refer to the captive mines as ever "selling" anything in a conventional sense, there remains the observation that the statement simply is not correct as to the facts. It was based on a newspaper account (note 9), and a little investigation of the reports of the Bureau of Mines would have shown the author the inaccuracy of his statement. Captive mines of steel mills are the principal suppliers of the coke-making furnace plants. During all months of 1949 furnace plant coke reserves were approximately twice as great as in all the corresponding months of 1948.

The book contains many illustrations of the misleading use of the common materials of economic analysis. The course of wages during the period 1935-1948 is discussed with almost no consideration of changes in general price levels during the period. Neither does the section dealing with the elimination of regional differentials in wages take into account that this movement coincided in timing with similar developments in other industries;[3] perhaps something more than unionism was at work. Moreover, the text may give the impression that union scales have obliterated all regional differentials, as there is no recognition of the fact that district agreements still permit noticeable differences in area rates.

Also the casual five-paragraph treatment of the new institution of the U.M.W. welfare fund (pp 115-16) is another illustration of inadequate consideration of important facts. Reference is made to the 1948 rate of 20 cents per ton without any mention that this was raised to 30 cents in 1950 and again to 40 cents in 1952. At the time the author was writing his text (early 1954, see p. 140) the sag of coal prices had made the then current rate represent over 10 per cent of realization-at-the-mine to many operators, an amount too significant to be dismissed with indifference.

This sort of loose procedure can hardly lead to any reliable conclusions and the frail evidence presented cannot support "an appraisal." Hence in the final chapter, with scrupulous documentation it is true, refuge is taken in summarizing views advanced earlier by other writers. With its substantial reliance upon the ideas of Arthur Ross, Henry Simons, Lloyd Reynolds, and C. E. Lindblom, this final chapter could have been written, save for minor changes,

[3] See W. S. Woytinsky et al., *Employment and Wages in the United States*, esp. Ch. 41, (New York, 1953).

without any reference to the earlier portions of the book. Thus the reader is left with very little fresh enlightenment on "The Union and the Coal Industry."

C. L. CHRISTENSON

Indiana University

An Introduction to the Study of Industrial Relations. By J. HENRY RICHARDSON. (London: George Allen and Unwin Ltd. Distributed by Macmillan in the U.S.A. 1954. Pp. 442. $5.25.)

From a rich background of experience in Great Britain and abroad, Professor Richardson of the University of Leeds has written what he terms a comprehensive survey of the field of industrial relations. Although the aim is not stated in terms of any one particular industrialized country, the book leaves the impression of being a Briton's view of policies and practices in his own country, with only oblique references to America and other countries. The American reader's interest will more likely stem from a desire to make comparisons of viewpoints than from a search for new or old knowledge challengingly presented. He will be interested for example in perceiving the extent to which our techniques in personnel administration find their parallels in Great Britain while our philosophies on collective bargaining and state intervention do not.

It should be pointed out at once that Richardson's definition of a comprehensive survey is not the same as an American's definition of a textbook in labor economics and labor relations. Thus when Richardson turns to the subject of wages, he deems it sufficient for his purposes to concentrate on the wage-setting mechanisms and on the key arguments influencing the wage settlement. He does not analyze in any detail the economic significance of the bargains arrived at, nor does he relate the wage-setting process to distributive theory in economics. In general, Richardson's survey stops at a description of institutions and techniques, and does not push on into examining the consequences flowing from those institutions and techniques.

In five separate areas, the author describes contemporary institutions developed by men in pursuit of better relations between employer and employed and better standards of living for all. Beginning with relations at the workplace in the face-to-face meetings of worker and boss, he treats the standard subjects of personnel administration. From this, he moves on to introduce the institutions of unionism and of collective union-management relations. Next he allots a section to the problems of wages and hours as those problems manifest themselves in the private sectors of the economy. The role of state intervention in the wage policy, conciliation, and social security fields carries him on to the national level. From there, it is only a short step to the international sphere and to a brief description of international labor organizations.

The tour here is a quick one and the guide is well informed. Yet there are two related problems about such a tour and Richardson effectively solves neither of them. First, there is the guide's temptation to hold us too long in one place that is of special interest to him but that is not explained to us in such a way as to arouse our interest. For this reader, too much time is spent

for example on a rather detailed description of the Bedeaux system of work measurement without developing those basic principles which add understanding as opposed to skills. At such points, the guidebook takes on the air of a manual. If one were to use this book as a classroom text, he would be at a loss to provoke discussion that lifted the students' sights beyond the details of technique and toward the economic and sociological implications of the Bedeaux system.

The other problem flows directly from the first one. The guide then must make up for lost time and needs to rush us past other spots with a few broad generalizations. With Richardson, such generalizations as are sprinkled throughout the book invite dissent in many instances and further clarification in others. Two examples: "It must be emphasized that there is not the slightest objection to time studies if the method is properly used. Indeed, for suitable work time studies are of value both to management and workpeople, and if standards of output are fixed by mutual agreement as they usually can be they remove a cause of friction and lead to more harmonious relations in the undertaking" (p. 73); and, "In some countries, *e.g.*, the United States, misunderstandings are still the cause of bitter costly conflicts, but in Britain the prospects for constructive advance are favorable" (p. 159).

There is furthermore an ambiguity of purpose which shows through in these pages. This takes the form of occasional lapses from objective description into policy prescription. My quarrel is both with the appropriateness of including any advice at all in such a survey and with the wisdom of the particular advice given here. Here are two instances of these prescriptions: "Clerical work has long had a higher prestige than many manual occupations—because of higher social status. Where this distinction is merely snobbish, it should be broken down" (p. 102); and, "One road to greater harmony in industry would be for workpeople to become part owners of the capital they use and to have a more direct interest in the profits of industry" (p. 429). In a book otherwise notable for dispassionate description, these passages are strangely out of place.

John R. Coleman

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Population; Social Welfare and Living Standards

A Theory of Economic-Demographic Development. By Harvey Leibenstein. (Princeton: Princeton University Press. 1954. Pp. xi, 204. $4.00.)

Professor Leibenstein concludes his book with the following remarkable sentence: "As a consequence it appears that to attempt to suggest means of testing propositions developed in this essay is at present otiose." This is true, he feels, because (1) scientific propositions can be tested only if they lead to predictions which then turn out to be true or false. (2) These predictions can not be tested because the variables discussed are not measurable—either for lack of statistics or lack of techniques of measurement. (3) Finally, by the time the statistics and techniques are perfected, the author feels that a more adequate theory of economic-demographic development can be evolved.

Such modesty indicates that instead of laying claim to having slain the

dragon of Malthusianism, Leibenstein presents himself as something of a reluctant dragon. What he is here saying is that his model for economic-demographic development has not been—and should not be—subject to empirical analysis and verification. Is it therefore useless? Evidently he does not think so and, I am glad to say, neither do I.

Needless to say this is a work in pure theory—a model highly simplified but apparently, like many models, complicated enough to defy empirical verification. Basically this model sets the rate of population increases against the rate of accumulation of capital in Malthusian countries and attempts to estimate the "critical minimum effort" required to pull the "system" out of its "stall" on dead center.

It sees the "Malthusian trap" in the undeveloped countries as tending to a stable equilibrium, with the major variables at an extreme value consistent with the survival of the population. Thus (1) population size tends to be at a maximum in relation to given resources, technology, and economic organization; (2) per capita income tends to be at a minimum consistent with population survival; with (3) birth and death rates at the maximum consistent with survival.

If we inject into this system given increments of income, what will happen? Will the increased average income lead to population growth, thus lowering income? Or will increases in average income lead to more saving, thus increasing the rate of capital accumulation faster than the rate of population increase? Here one has a choice of two models. (1) The rate of population growth can be regarded as a monotonic increasing function of average income up to a point beyond which the rate continues at its maximum value; or (2) it can be postulated that above a certain level of average income, the rate of population growth will decline.

In this moving series of equations, what is the "critical minimum effort" necessary for the destabilization of the Malthusian equilibrium? Under certain conditions attempts to escape Malthusian stagnation will—when they fail—make the situation worse. For the average income-gain multiplier to be larger than the population multiplier, the investment for example should be labor-elastic in character. Thus it is better to build a railway system than to invest in the production of agricultural machinery which at the onset will displace labor. Later, however, fewer workers must grow more food to supply urban industrial populations.

The first explanations are developed at the "macro" level of the total systems—economic and demographic. Ultimately, however, the analysis must get down to the "micro" level; that is, it must consider individual choices, that is, the decision-making process in terms of both the technological and biological constructs involved. Here the analysis attempts to integrate the economic order with the *mores* and social values involved in the high fertility complex.

This represents a complex system hardly more amenable to the symbols, curves, and equations of a certain type of economic theorist than to the conventional verbalizing of the orthodox cultural demographer. No model can

include all the variables involved in the real situation. Actually the more "micro" the model, the more variables that are left out. How many can be left out and still give us a model which is functional or "workable"? Aye, here is the rub; it leaves both the author and the reviewer feeling somewhat otiose.

The volume ends with a chapter on optimum population theory which adds little either to the model or to the concept of the optimum. This book is distinctly not the cup of tea to which demographers of the sociological variety happen to be addicted. Nevertheless, it is something which required doing. It is also something which for the good of my empirical little soul, I am glad I have read. I do predict, however, that if—and when—some of the backward countries break out of the Malthusian trap, no one will refer to Leibenstein's book as having had anything to do with it. This will be unfortunate and if I am around at the time, I hope to remedy the oversight.

RUPERT B. VANCE

University of North Carolina

Employment Expansion and Population Growth—The California Experience 1900-1950. By MARGARET S. GORDON. (Berkeley and Los Angeles: University of California Press. 1954. Pp. xiii, 192. $3.50.)

Dr. Gordon's monograph continues a series of historical studies of California's population and economy sponsored by the Institute of Industrial Relations at the University of California (Berkeley). The major emphasis of this study is on the relation of inmigration to economic growth in the first half of this century. In this context, the author examines the degree and timing of changes in the size and structure of the population and in the levels and structure of employment; comparisons are made with national trends, and differentials in income and unemployment between the state and the nation are analyzed. In the course of interpreting the interrelationships of population and economic growth, a number of interesting hypotheses are tested.

A major finding of the study is that the state's highest rates of inmigration were associated with rapid expansion in employment in California, and the time periods concerned coincided with those of rapid expansion in the nation. It is recognized that the reasons for migration to California may be noneconomic as well as economic in nature, but the evidence suggests that the timing of migration is strongly influenced by the levels of job opportunity prevailing in the period concerned.

Historical data on unemployment are also used to support the view that net migration to California is sensitive to changes in the rate of economic expansion. The only instance of a serious maladjustment between the two was found in the persistence of a relatively high rate of unemployment in the state during the years following the second world war. After comparing migration waves to California and to other selected states, the conclusion is reached that migration waves may be related to secondary secular swings in the rate of growth in the national economy.

The author finds no evidence that extensive inmigration to California has led to a decline in long-standing wage differentials between California and

other regions of the country. A recent decline in per capita income in California is attributed not to a decline in wage income but to a change in the structure of the population, namely, a decline in the relative underrepresentation of children, and to a decline in the relative importance of the extractive industries in the economy.

Despite an increase in manufacturing employment in recent decades, this report indicates that the structure of employment in California has been remarkably stable over a half century and that the state continues to have substantially higher proportions of workers than the nation in the distributive and service industries. Most of the manufacturing industries that have flourished in California have been "market-oriented" or owe locational advantages to the state's natural resources, including climate. As a result of the most recent developments, California's economy has become increasingly dependent on the level of spending for national defense.

Dr. Gordon finds that the hypothesis that California's economy is less vulnerable than the nation to cyclical changes can not be adequate tested from the available data. Employment in the state is found to be subject to relatively high seasonal variation in some industries that employ a substantial proportion of the labor force. Moreover, lags in fluctuations in the rate of inmigration compared with employment changes have occasionally led to a relatively high volume of frictional unemployment.

The evidence with respect to the effect of population growth on the pattern of industrial expansion is inconclusive, partly because of instability in the development of certain industries and persistent declines in the national and regional demand for labor in others. A methodological problem is raised by this part of the analysis. Apart from the validity of the assumption that all types of employment may be expected to expand with population growth, this reviewer questions the use of ratios of the rate of change in one to the rate of change in the other as a major indicator of trends, because ambiguous figures result if one rises and the other declines.

The major findings of the study are not affected by this methodological defect, however, and the report will be of interest to all regional analysts and to economists concerned with the geographic impact of national developments. More importantly, this is one of a very small number of regional studies that attempt to test important aspects of economic and social theory about economic growth and migration.

GLADYS L. PALMER

University of Pennsylvania

Hungry People and Empty Lands. By S. CHANDRASEKHAR. (New York: Macmillan. London: George Allen and Unwin Ltd. 1954. Pp. 306.)

This is basically a "tract for the times." Like many predecessors, it stresses the urgency of the population problems in underdeveloped areas, and presents a policy to deal with those problems. The thesis is simple and is no longer original. If the present rate of population growth continues in such countries

as India and China, the growth will swallow up any potential gains from industrialization and agricultural development. This will make the achievement of higher standards of living in those countries impossible, and could lead to such explosive internal pressures within the countries that demands for new land would become irresistible and war would result. To avoid these contingencies the author advocates a series of policies laying stress upon migration to currently "empty" lands, accompanied by birth control, as well as the usually advocated measures of industrialization and agricultural development.

The book deserves praise for emphasizing the possibility of migration. It examines the population-absorbing capacities of those countries that the author considers would be able to profit from large-scale immigration of peoples from the "crowded" countries. However, the book has many weaknesses. The major one is that the author sacrifices factual support and close reasoning for a supposedly popular and frequently weak level of argument. While the reviewer sympathizes with the author's position and agrees with him as to the urgency of the problem, he is unable to accept many of the arguments presented. A major argument, frequently repeated in the book, is that the pressure of population upon land is the basic cause of war. Unfortunately the author cites as strong supporting evidence Hitler, Mussolini and Japanese military leaders. The author obviously has failed to distinguish between rationalizations for policies and the causes of the policies. Furthermore, when the author states that even if the argument may not hold in "fact" it would be equally valid if it held psychologically, he is making the argument one that it is impossible to disprove. It cannot be put to any test and therefore is not valid as a scientific argument. In fact the cases of Germany, Italy and Japan may show that even with relatively high and increasing living standards countries may be induced into war by the sight of *higher* standards among other countries, rather than by their own absolute level of poverty.

This same weakness characterizes the discussion of the "empty" lands. The reviewer agrees with the criticisms of racial limits to immigration, especially as the author himself recognizes that any migration on a large scale must be accompanied by birth control among the migrants and in the "home" country if it is to be part of a policy toward a solution rather than a "palliative." However, the author never in fact supports his arguments that the "empty" lands can in fact *now* support large populations. Rather he usually presents statements, and these statements do no more than contradict statements to the contrary. The author may also confuse the capacity of a country to absorb migrants *physically* and its *economic* capacity to absorb migrants.

The author cites the Japanese experience with industrialization and population growth to support his argument that population growth absorbed the gains of economic development and led to war. Lockwood's recent thorough study of Japanese economic development from 1870-1937 does not support this argument. Rather Lockwood shows that, while population growth probably did *not* on balance assist Japan's economic development, nevertheless Japan's economic development in all sectors of the economy and its entrance into the world market did lead to a steady growth in per capita income. Only

when Japan sought to become self-sufficient did the leaders find that its internal resources were insufficient to support the population at higher income levels, to develop an Empire, and to support a great war machine. Furthermore, even with open land areas in Hokkaido within Japan proper and with an Empire, the Japanese never did migrate to those regions in large numbers.

The discussion of India and China appears to be of more value, not only because it brings together data unavailable elsewhere, but because it provides insights into the problems of those two countries and the difficulties of solution.

The author's policy proposals are of some interest. The suggestions for an International Migration Authority and for a survey of the "open" areas of the world are worth while both for determining certain facts concerning "open" areas, and as a basis for carrying out migration. The discussion of internal population policy and of planned population maxima within countries is provocative, but the reviewer feels that these policies approach oversimplification in dealing with a very complex problem. One wishes also that the criticisms of colonialism added something to the subject, without essentially flogging a "dead" horse.

The reviewer may appear too critical. He is sympathetic to the author's position, and realizes that the author is primarily interested in arousing concern, stimulating discussion, and presenting policy solutions for a very serious problem. The book succeeds partially in these aims. However, by its weak argumentation, both logically and factually, it may discourage, rather than attract, many potential supporters of the author's purposes or policies.

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Population. By IAN BOWEN. (Cambridge: Cambridge University Press. 1954 Pp. xv, 256. 10 *s*., 6*d*.)

This short volume is the latest addition to the Cambridge Economic Handbooks. (It replaces Harold Wright's book by the same title, published in 1923.) Like the others in the series it is intended for the "ordinary reader and uninitiated student"—a fact that may be of importance in assessing the value of this particular volume.

The book is divided into three parts. The first contains a brief sketch of the world's and Britain's demographic experience. The bulk of the book, Part II, is devoted to matters of theory. There is a very long chapter on Malthusian theory, and shorter discussions on optimum population theory, population growth and the demand and supply of labor, economic expansion and population growth, and international migration. In the final section we find a discussion of the future prospects of British and world population, and their connection to economic and social well being.

Much of this volume is in the nature of a running argument of one sort or another rather than straightforward exposition of facts and theories. Professor Bowen appears to have definite convictions on a number of questions, and these in large part appear to determine the nature of this work. On the

whole the book is provocative rather than balanced, discursive and general rather than technical, and often appears to be chatty rather than systematic. A great deal of space is devoted to what might be called "What Malthus Really Meant and Why He Was Wrong." Bowen is not especially tolerant of the more charitable interpretations of the Malthusian position, and an explicit anti-Malthusian tone is evident throughout. He appears to believe that there is not very much danger of overpopulation anywhere, since ". . . diminishing returns are not a bogey that ought to frighten anyone capable of discerning the immense ranges of output in all industries, including agriculture, where increasing returns are possible" (p. 150). There are frequent passing references to social scientists and other scholars of varying degrees of fame, but it is to be doubted that the ordinary reader or uninitiated student would have heard of more than a very small proportion of them, at best.

There are many things that demographers talk about that will not be found here. For example, there is no systematic discussion of the various measures and indices of population growth developed by demographers, nor will the reader learn very much about the methods of population forecasting that have been employed in the past. Similarly, the usual discussions of the factors often considered as significant in determining the changing patterns of mortality and fertility are either absent or, when considered, treated only *en passant*, and rather discoursively.

In sum, we might say that this short and highly readable volume will introduce the reader to "the population debate," but many teachers may want their students to get somewhat more of the other side than is likely to be found in this particular handbook.

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Medical Care for Tomorrow. By MICHAEL M. DAVIS. (New York: Harper & Brothers. 1955. Pp. xii, 497. $6.50.)

This book is a gold mine for the field of medical care.

Michael Davis has been professionally concerned with medical economic affairs for more than forty years. He has been at various times an administrator, a director of research, and a reformer. For the last dozen years he has led the fight for compulsory national health insurance. Davis has drawn upon his fund of knowledge to produce the first approximation of an integrated picture of all the variables inherent in our national institutional structure for the distribution of medical care. To do this he has drawn upon the disciplines of philosophy, political science, history, economics, and the medical sciences themselves. An integrative task such as this involves recognizing the limits of the usefulness of each single approach to the subject. It is the sort of task that, though often attempted by committees, is finally possible only within single minds. Here the task is done by a man who has been applying his mind to the problems for a working lifetime.

Many persons may disagree with Davis in special cases. Most persons who

read his book, wherever they disagree, will pay him the immense compliment of accepting his basic assumptions regarding the dynamics of medical care in our society.

The first part of the book deals with the basic facts, and suggests useful working ideas. Economists will wish to criticize Davis' use of the term "demand"; he fails properly to relate the term to purchasing power. But his suggested term "social capital," applied to the public's investment in hospitals and similar facilities, is worthy of much wider application, and suggests exciting analytical possibilities. Davis points out elemental facts that, I am ashamed to say, never occurred to me. One is that though medical charges are incurred by individuals, bills tend to be met by families; this adds to the burden of larger families, and throws doubt on the usefulness of some statistical presentations. There is a useful interplay between description and analysis in this section; he does not attempt to present a great compendium of facts; he lets the argument have precedence, and adds what facts are relevant. A great contribution is Davis' constant emphasis upon the dimensions of the unknown in the field of medical care. We know little, for instance, of how to measure the quality of medical care. Here as throughout the book, Davis refers to any significant contributions which have been made, but also makes clear his own opinion in the matter.

The second part deals with the role of organization in the distribution of medical care, and includes much historical material on the genesis of the organizational pattern of the present. Davis succeeds in convincing the reader that there is nothing particularly sacred about the present situation.

The third part is devoted to health insurance, an institution close to the author's heart. The treatment of the growth and coverage of existing plans is very full indeed. The author writes, "A major consideration is that neither 'catastrophic insurance,' nor indemnity policies, nor insurance of the Blue Shield type offers opportunity for the preventive services . . . which lessen the likelihood of high-cost illnesses themselves" (pp. 225-26). Later he writes, ". . . health insurance is a financial mechanism for a medical end. The mechanism must serve the end and not be an end in itself. Those who elevate precepts of private insurance into immutable principles confuse the end with the mechanism" (p. 262).

The fourth part is a discussion of what Davis thinks should be done to improve medical care in the United States. This part also is interesting factually as well as conceptually. Davis states the case for compulsory national health insurance forcefully, but quite in its logical place within the volume as a whole. This chapter in no way colors the total work; and the book would have been incomplete without it.

I predict that this volume will go through many revisions, but that it will never be replaced. The field of medical care now has too many and too technical special aspects for any newcomer to achieve a mastery of the whole with justice to the parts. Every expert in a part of the field will have reason to dispute Davis; I challenge anyone to offer a substitute for his underlying logical structure.

The book has a useful selected bibliography listing fugitive and out-of-print materials as well as the standard works. The style is readable, if a bit discursive. Through all of the text the personality of the author is apparent—a reformer of the Old School, interested in "expedited gradualism," who concludes by saying "The evils of today should by no means be tolerated because they were worse yesterday" (p. 434).

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TITLES OF NEW BOOKS

Economic Theory; General Economics

BECKWITH, B. P. *Marginal-cost price-output control—a critical history and restatement of the theory.* (New York: Columbia Univ. Press. 1955. Pp. viii, 283. $5.75.)

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BOULDING, K. *Economic analysis.* 3rd ed. (New York: Harper. 1955. Pp. xx, 905. $6 50.)

With regard to the new edition, the author says in the preface: "Macroeconomics now takes a firmly equal place with microeconomics. There is more attention to problems of dynamics and growth Marginal analysis has been moved in the direction of greater generality."

CHAMBERLAIN, N. W *A general theory of economic process* (New York: Harper 1955. Pp. viii, 370. $5.)

COWARD, D *Økonomisk risiko og usikkerhet* (Economic risk and uncertainty). (Bergen· Bedriftsøkonomens Forlag. Oslo. 1953. Pp. 349)

FUZ, J. K *Welfare economics in English Utopias—from Francis Bacon to Adam Smith* (The Hague: Martinus Nijhoff. 1955. Pp viii, 113. *f.* 7 —.)

GEMMILL, P. F. *Current introductory economics* (New York· Harper. 1955 Pp. xii, 711)

A successor to the author's *Fundamentals of Economics* "Teachers who have used *Fundamentals* will find in *Current Introductory Economics* a good deal of familiar material; but it is material that remained after the earlier book had been thoroughly reexamined, and its various parts deleted, expanded, rearranged, or rewritten whenever such treatment gave promise of improving it eight chapters have been added. . . ." (From the author's preface)

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NOTES

Erratum: The name of the nominee for president of the American Economic Association published in this section of the June 1955 number of the *Review* erroneously appeared as Edwin E. White. The nominee for the office of president in 1956 is Professor Edwin E. Witte, of the University of Wisconsin.

SIXTY-EIGHTH ANNUAL MEETING OF THE AMERICAN ECONOMIC ASSOCIATION

Hotel Commodore, New York City, December 28-30, 1955

Preliminary Announcement of the Program

Nearly half of the sessions of the program for this year are centered upon the economic growth of the United States, that is, on the problem of keeping the United States economy moving onward and upward. This means that both the secular and the periodic phases of the problem will be explored. Nine of the remaining sessions, including four that are joint with other associations, are primarily international or foreign in their scope and incidence Since this is the year when the Association meets jointly with other social science associations, twelve sessions will be held jointly with other associations, in addition to the two joint luncheon meetings. The papers and discussions of eighteen sessions will be published in the Proceedings.

Wednesday, December 28, 1955

10:00 A.M. Meeting of the Executive Committee

12:30 P.M. Luncheon Meeting of the Executive Committee

12:30 P.M. Luncheon Meeting (Joint with the American Statistical Association)
THE ECONOMIC OUTLOOK
Speakers: EDWIN G. NOURSE, Joint Council on Economic Education
ALAN H. TEMPLE, National City Bank of New York

2:30 P.M. Economic Growth. I. STATEMENT OF THE PROBLEM OF KEEPING THE UNITED STATES ECONOMY MOVING FORWARD, BUT STEADILY
Chairman: CALVIN B. HOOVER, Duke University
Papers: Scope and Objectives of Ten Sessions on Economic Growth
THE CHAIRMAN
The Economic History of the United States in These Terms from 1870 to 1955, but Particularly since 1900
MOSES ABRAMOVITZ, National Bureau of Economic Research and Stanford University
The Goals of Economic Growth in the United States—Economic and Other Social Priorities
PAUL T. HOMAN, University of California at Los Angeles
Discussion: WILLIAM J. FELLNER, Yale University
FREDERICK V. WAUGH and JAMES P. CAVIN, U. S. Department of Agriculture

THE ECONOMIC POTENTIALS OF LATIN AMERICA
Chairman: THEODORE W. SCHULTZ, University of Chicago
Papers: Developments Under Way, Obstacles and Problems, and Potentials
SUNE CARLSON, United Nations
Some Policy Lessons for Economic Development in this Part of the World
THEODORE W. SCHULTZ, University of Chicago

Discussion: GEORGE GARVY, Federal Reserve Bank of New York
EMILIO G. COLLADO, Standard Oil of New Jersey
SIMON ROTTENBERG, University of Chicago

THE CHANGING PATTERNS OF COMPETITION IN TRANSPORTATION AND OTHER PUBLIC UTILITY LINES
Chairman: EDWARD W. MOREHOUSE, General Public Utilities Corporation
Papers: The Competition of Long-Distance Motor Trucking—Farm and Industrial Products and Supplies
CHARLES A. TAFF, University of Maryland
The Partnership Policy in Regional Power Planning
WALTON SEYMOUR, Washington, D.C.
Federal Regulation of Natural Gas Producers and Gatherers
MARTIN L. LINDAHL, Dartmouth College
Discussion: FRED V. STONE, Canadian Pacific Railway

THE THEORY OF GOVERNMENT EXPENDITURES (Joint with the Econometric Society)
Chairman: OSWALD BROWNLEE, University of Minnesota
Papers: Aspects of the Abstract Theory of Public Expenditures
PAUL A. SAMUELSON, Massachusetts Institute of Technology
A Multiple Theory of the Budget
RICHARD A. MUSGRAVE, University of Michigan
Discussion: WALTER S. SALANT, Brookings Institution
JULIUS MARGOLIS, University of California

8:30 P.M. Economic Growth II THE PRODUCTION AND CONSUMPTION ECONOMICS OF ECONOMIC GROWTH
Chairman: WILLARD L. THORP, Amherst College
Papers: The Production Economics of Economic Growth
W. DUANE EVANS, Bureau of Labor Statistics
The Consumption Economics of Economic Growth
RUTH P. MACK, National Bureau of Economic Research
The Value and Pricing Aspects
ARYNESS JOY WICKENS, Bureau of Labor Statistics
Discussion: EARL O. HEADY, Iowa State College
ROBERT FERBER, University of Illinois

CURRENT ECONOMIC THOUGHT AND ITS APPLICATION AND METHODOLOGY IN CONTINENTAL EUROPE
Chairman: ALEXANDER GERSCHENKRON, Harvard University
Papers: The Scandinavian Countries
HANS BREMS, University of Illinois
Holland
HANS THEIL, University of Chicago
Italy
FRANCISCO MODIGLIANI, Carnegie Institute of Technology
Eastern Europe Outside of Russia
Question Period Led by the Chairman

ARE UNION PRACTICES MONOPOLISTIC? (Joint with the Industrial Relations Research Association)
Chairman: RICHARD A. LESTER, Princeton University
Paper: To be announced
EDWARD S. MASON, Harvard University

Panel: PETER O. STEINER, University of California
JULES BACKMAN, New York University
PETER HENLE, American Federation of Labor
CHARLES C. KILLINGSWORTH, Michigan State College
MINEAR SARGENT, Caterpillar Tractor Company

TARIFF POLICY FOR THE U.S.A., A STRONG RICH COUNTRY (Joint with American Farm Economic Association)
Chairman: An Introductory Statement. CHARLES P. KINDLEBERGER, Massachusetts Institute of Technology
Panel: DON D. HUMPHREY, Duke University
LAWRENCE W. WITT, Michigan State College
RICHARD M. BISSELL, Washington, D.C.
DENNIS W. FITZGERALD
DONALD B. MARSH, McGill University
Summary Statement by the Chairman

Thursday, December 29

9:30 A.M. Economic Growth. III. INCOME DISTRIBUTION ASPECTS OF EXPANDING PRODUCTION AND CONSUMPTION
Chairman: PAUL SAMUELSON, Massachusetts Institute of Technology
Papers: Distribution of Aggregate Income between Taxes and Other than Taxes, and among Consumption, Savings, and Capital Formation
Distribution of Incomes of Business Firms among Taxes, Dividends, and Retained Earnings
JOHN LINTNER, Harvard University
Discussion: LLOYD ULMAN, University of Minnesota
LORIE TARSHIS, Stanford University

Economic Growth. IV. THE SHORTENING WORK WEEK AS A COMPONENT OF ECONOMIC GROWTH (Joint with the Industrial Relations Research Association)
Chairman: GERHARD COLM, National Planning Association
Paper: The Alternatives
CHARLES STEWART, United States Department of Labor
Panel: CLARK KERR, University of California
SOLOMON BARKIN, Textile Workers Union of America
NELSON N. FOOTE, University of Chicago
FOREST F. HILL, Cornell University
LESTER KELLOGG, Deere and Company

REPORT OF THE ATTORNEY-GENERAL'S COMMITTEE ON ANTI-TRUST POLICY
Chairman: CORWIN D. EDWARDS, University of Chicago
Papers: Market Power and Business Conduct: Some Comments on Anti-Trust Policy
EDWARD S. MASON, Harvard University
Enforceable Competition: Unruly Reason or Reasonable Rules
KINGMAN BREWSTER, Harvard University
Competition: Hard or Soft
CLAIR WILCOX, Swarthmore College
Discussion: GEORGE W. STOCKING, Vanderbilt University
ALFRED E. KAHN, Cornell University
CLARE E. GRIFFIN, University of Michigan
GEORGE J. STIGLER, Columbia University

Economic Growth. X. URBAN GROWTH AND DEVELOPMENT (Joint with Regional Scientists)
Chairman: WALTER ISARD, Massachusetts Institute of Technology
Papers: The Spread of Cities
DONALD J. BOGUE, University of Chicago
Changes Within Cities
CHESTER RAPKIN, Columbia University
Discussion: RICHARD U. RATCLIFF, University of Wisconsin
MARTIN MEYERSON, University of Pennsylvania
JOSEPH L. FISHER, Resources for the Future, Inc.

THE DYNAMICS OF FOOD RETAILING (Joint with the American Marketing Association and the American Farm Economic Association)
Chairman: JOSEPH ACKERMAN, Farm Foundation
Papers: Movements in the Retail Distribution of Food in the United States
ROBERT W. MUELLER, Editor, ***The Progressive Grocer***
Some Recent Developments in Food Retailing in Europe
HERBERT EKLOEH, Germany
Supplementary Statements: WILLIAM APPELBAUM,
RICHARD H. HOLTON, Harvard University

2:30 P.M. Economic Growth V. THE INCREASE-OF-CONSUMPTION PART OF ECONOMIC GROWTH
Chairman: ASHER ISAACS, University of Pittsburgh
Papers: Price and Income Elasticity of Demand as Determinants of the Increase-of-Consumption Part of Economic Growth
ELIZABETH GILBOY, Harvard University
The Potentials of the Shifting of Price- and Income-Elasticity Demand Curves in Order to Keep the Economy Moving Forward
JAMES DUESENBERRY, Harvard University
Brief Reports on Current Research Projects in Consumption and Demand
JOHN B. LANSING, University of Michigan
IRWIN FRIEND, University of Pennsylvania
JAMES TOBIN, Yale University
ROBERT SCHLAIFER, Harvard University

Economic Growth VI. GOVERNMENT EXPENDITURES AND ECONOMIC GROWTH
Chairman: ROY BLOUGH, Columbia University
Papers: Government Expenditures and the Long-Run Goals of Economic Growth
C. LOWELL HARRISS, Columbia University
Government Expenditures and the Short-Run Goal of Steady Growth
DAN T. SMITH, Harvard University
Discussion: WALTER FROELICH, Marquette University
JOHN F. DUE, University of Illinois
MARION CLAWSON, Resources for the Future, Inc

THE POPULATION SPECTRE—RAPIDLY DECLINING DEATH RATES IN DENSELY POPULATED COUNTRIES (Joint with the American Farm Economic Association)
Chairman: MERRILL K. BENNETT, Food Research Institute, Stanford University
Papers: A Statement of the Situation
KINGSLEY DAVIS, University of California
Food and Agricultural Possibilities
CHARLES E. KELLOGG, United States Department of Agriculture
Nonagricultural Possibilities
REUBEN E. SLESINGER, University of Pittsburgh

Possible and Probable Outcomes, and Courses of Action to be Considered
JOSEPH J. SPENGLER, Duke University
Question Period Led by the Chairman

FEDERAL RESERVE BOARD COMMITTEE REPORTS: I. SAVING STATISTICS AND CONSUMER EXPECTATIONS
Chairman: RALPH A. YOUNG, Federal Reserve Board
Papers: RAYMOND GOLDSMITH, National Bureau of Economic Research
JAMES TOBIN, Yale University
Discussion: GEORGE KATONA, University of Michigan
MORRIS COHEN, National Industrial Conference Board

8:30 P.M. *Chairman:* THOMAS NIXON CARVER, Santa Monica, California
PRESIDENTIAL ADDRESS: Agriculture in the Economy of the Nation
JOHN D. BLACK, Harvard University

Friday, December 30

9:30 A.M. Economic Growth. VII. THE MONETARY ROLE IN BALANCED ECONOMIC GROWTH
Chairman: MILTON FRIEDMAN, University of Chicago
Paper: CHARLES R. WHITTLESEY, University of Pennsylvania
Panel: IRA O. SCOTT, University of Minnesota
PAUL W. MCCRACKEN, University of Michigan
HOWARD S. ELLIS, University of California
EDWARD S SHAW, Stanford University

Economic Growth. VIII HIGHWAY DEVELOPMENT AND FINANCING (Joint with the American Finance Association)
Chairman: WALTER W. HELLER, University of Minnesota
Paper: Highway Development and Financing as a Case Study in the Problem
THE CHAIRMAN and OSWALD H. BROWNLEE, University of Minnesota
Panel: HAROLD M. GROVES, University of Wisconsin
JAMES C. NELSON, Washington State College
ARNOLD M. SOLOWAY, Harvard University
WILLIAM D. ROSS, Louisiana State University
HAROLD W. TORGERSON, Northwestern University

ECONOMICS IN THE CURRICULA OF SCHOOLS OF BUSINESS
Chairman: RAYMOND T. BOWMAN, University of Pennsylvania
Papers: Over-all Statement of the Problem and Situation
NEIL H. JACOBY, University of California at Los Angeles
By Universities: GEORGE LEE BACH, Carnegie Institute of Technology
EDWARD H. LITCHFIELD, Cornell University
DONALD W. O'CONNOR, Columbia University
ARTHUR M. WEIMER, University of Indiana
EWALD T. GRETHER, University of California at Berkeley

THE LAND TENURE SITUATION AROUND THE WORLD (Joint with the American Farm Economic Association)
Chairman: JOSEPH ACKERMAN, Farm Foundation
Introductory Paper: KENNETH H. PARSONS, University of Wisconsin
Papers by Individual Countries:
India and Pakistan
LEE R. MARTIN, North Carolina State College
Spain and Southwest Europe
José VERGARA, Spanish Embassy

Australia
THOMAS H. STRONG, Bureau of Agricultural Economics, Australia
Mexico
EDMUNDO FLORES, *Nacional Financiera*, Mexico City
Japan
WOLF LADEJINSKY, Department of State
Question Period Led by the Chairman

FEDERAL RESERVE BOARD COMMITTEE REPORTS: II. INVENTORY STATISTICS, INVESTMENT EXPECTATIONS, AND GENERAL BUSINESS EXPECTATIONS
Chairman: MARTIN GAINSBRUGH, National Industrial Conference Board
Papers: GEORGE W. TERBORGH, Machinery & Allied Products Institute
J. FREDERICK DEWHURST, Twentieth Century Fund
Discussion:

12:30 P.M. Luncheon Meeting (Joint with the American Finance Association)
REFLECTIONS OF A CENTRAL BANKER
Speaker: ALLAN SPROUL, President, Federal Reserve Bank of New York

2:30 P.M. Economic Growth IX. UNEMPLOYMENT AS A PHASE OF ECONOMIC GROWTH
Chairman: EDWIN G. NOURSE, Joint Council on Economic Education
Paper: The Structure of Unemployment in the United States
ISADOR LUBIN, Industrial Commissioner, State of New York
Discussion: EWAN CLAGUE, United States Department of Labor
LAZAR TEPER, International Ladies Garment Workers Union
Paper: Measures to be Taken at Different Levels and Distributions of Unemployment
ALBERT G. HART, Columbia University
Discussion: ALBERT S. EPSTEIN, International Association of Machinists
Question Period

ECONOMIC THOUGHT AND ITS APPLICATION AND METHODOLOGY IN THE EAST
Chairman:
Papers: India
MAX F. MILLIKAN, Massachusetts Institute of Technology
Pakistan
OVERTON H. TAYLOR, Harvard University
Japan
MARTIN BRONFENBRENNER, University of Wisconsin
The Middle East
DON PATINKIN, The Hebrew University, Israel
Question Period Led by the Chairman

THE ECONOMIC POTENTIALS OF AFRICA
Chairman: JOHN W. GARDNER, Carnegie Corporation of New York
Papers: Economic Development, The African Scene
WILLIAM A. HANCE, Columbia University
Anthropological Factors in the Economic Evolution of Africa
MELVILLE J. HERSKOVITZ, Northwestern University
Discussion: LLOYD G. REYNOLDS, Yale University
CALVIN W. STILLMAN, University of Chicago
SANFORD A. MOSK, University of California

MINIMUM WAGES AND OTHER LABOR STANDARDS CONSIDERED IN RELATION TO ECONOMIC GROWTH IN UNDERDEVELOPED COUNTRIES (Joint with the American Farm Economic Association)

Chairman: KARL BRANDT, Food Research Institute, Stanford University
Papers: In Factory Employment
ELMO P. HOHMAN, Northwestern University
In Small-scale and Cottage Industry
JEANNE S. MINTZ, New York City
In Agriculture
LOUIS J. DUCOFF, United States Department of Agriculture
Supplementary Statements: EGBERT DEVRIES, International Bank for Reconstruction and Development
JOHN WINDMULLER, Cornell University
J. HENRY RICHARDSON, University of California.

5:00 P.M. Business Meeting
6:00 P.M. Dinner Meeting of the Executive Committee

THE FIRST CONGRESS OF THE INTERNATIONAL ECONOMIC ASSOCIATION, ROME, ITALY, SEPTEMBER 6-11, 1956

The International Economic Association came into existence in 1950, through the efforts of a group of European and American economists convened by UNESCO. In constitution it represents a federation of the various national associations in the field of economics, including the American Economic Association. Its Council is nominated by the national associations, and four representatives of the American Economic Association serve on it. The officers of the International Economic Association for the current year are as follows: *Honorary Presidents:* J. M. Clark, Luigi Einaudi, Gottfried Haberler, A. C. Pigou, and Arthur Spiethoff; *Executive Committee:* Howard S. Ellis (President), Leon Dupriez (Vice-President), Austin Robinson (Treasurer), Walter Hoffmann, Emile James, Erik Lindahl, Volrico Travaglini, C. N. Vakil, Xenophon Zolotas; *Secretary:* Helene Berger-Lieser, Paris VIII, 7, Rue de Miromesnil.

A main feature of the work of the International Economic Association has been a series of small conferences of persons making noteworthy contributions to certain defined fields of economics. The first conference was concerned with the problems of long-term international balance; the second with methods of teaching economics; the third with the regulation of monopoly; the fourth with the business-cycle in the postwar world; the fifth with the determinants of economic progress; the sixth with wage determination; the seventh - being held in September, 1955—is concerned with problems of migration. The working papers and discussions of these conferences have been or are to be publishd.

These small conferences have been of very great value in bringing together workers in the same fields, many of whom had never previously met each other, and in clearing up ambiguities and misunderstandings But they have inevitably been confined to small numbers of selected experts, and it has not been practical to invite many who would have enjoyed opportunities to meet and discuss

The purpose of the Rome Congress is to provide a wider opportunity for any members of the twenty-three associations that compose the International Economic Association to take part in the work of the Association. All members of the American Economic Association are entitled to take part in the Congress. The program follows:

Thursday, September 6. Opening of the Congress. Stability and Progress: The Richer Countries' Problem, by Sir Dennis Robertson.

Friday, September 7. Stability and Progress: The Poorer Countries' Problem, by Jacob Viner.

Saturday, September 8. The Quest for Stability: The Real Factors, by François Perroux

Monday, September 10. The Quest for Stability: The Monetary Factors, by Gottfried Haberler.

Tuesday, September 11. International Stability and the National Economy, by Erik Lundberg.

A fee of $5.00 will entitle participants to receive all Congress papers, which will be available in Rome and not distributed in advance. Meetings will take place in the Faculty of Law of the University of Rome, facilities of which will be available to the IEA by

courtesy of Professor G. Ugo Papi, Rector of the University of Rome. Each day's sessions will open with an address, the text of which will be available to Congress participants in the two official languages, French and English. The subsequent discussion of the address will, in each case, be introduced by two speakers chosen in advance. The discussion will be interpreted into the two official languages.

On behalf of the IEA, the Italian Tourist Agency CIT will take care of registration and the collection of the conference fee, as well as travel arrangements and hotel reservations. Those wishing to participate should as soon as possible write to CIT (Congress Department), Piazza Colonna 193, Rome, Italy. They will receive an application form, together with details of reduced fares and of hotel accommodation available in Rome.

International Committee for Social Sciences Documentation

This Committee was created at the end of 1950 as a result of meetings of experts convened by UNESCO. The purposes of the Committee are the coordination and improvement of existing bibliographic instruments for the social sciences, and the creation of new bibliographic instruments in this area. It is the intention to establish periodical comprehensive bibliographies for each major discipline; and to publish periodicals containing abstracts and specialized bibliographic essays, at least for certain disciplines.

Annual international bibliographies have been undertaken for sociology (Volume I, covering the year 1951, appeared in 1952), for political science (Volume I, for 1952, appeared in 1954), and for economics (Volume I, covering 1952, appeared early in 1955). *International Political Science Abstracts*, a quarterly journal of abstracts of articles in the field of political science, has appeared regularly since 1951. Since 1952, bibliographic reports on important research trends in sociology have been published twice a year in *Current Sociology*. The Committee has prepared an *International Repertory of Social Science Documentation Centers* and *A Selected Inventory of Periodical Publications* (the latter was published by UNESCO in 1951, and the first supplement appeared in 1953); it has edited a *World List of Social Sciences Periodicals* which was published by UNESCO in 1954; and, on an experimental basis, it prepared in 1954 some cumulative lists of works used in the teaching of the social sciences in the universities of the United Kingdom and of Sweden.

The address of the Committee is: Comité International pour la Documentation des Sciences Sociales, 27 rue Saint-Guillaume, Paris 7; and the secretary general is J. Meyriat

Schumpeter Prize Fund

A fund has been gathered by friends of the late Joseph A. Schumpeter to establish a prize to be awarded periodically for original work in the field of economics The Schumpeter Prize in the amount of not less than $1,000 will be awarded once every two years providing that sufficiently meritorious work has come to the attention of the awarding board If sufficient income has accumulated and work of sufficient merit has been found, the awarding board may award prizes in one-year intervals

Anyone who has made an original contribution to economics is qualified to obtain the prize—provided, however, that his contribution falls within those branches of economics in which the late Professor Joseph A. Schumpeter made his most creative contributions For the present, the study of economic development, and its interrelations with historical, social, and political evolution, and the interrelations between economic theory, statistics, and history seem to be the most appropriate; but relevant theoretical work is to be included.

The primary test in awarding the prize is to be the depth and originality of perception Whether the work is an article in a periodical or a full-length monograph is irrelevant

The prize will be awarded by a board consisting of three members of the faculty of economics at Harvard University.

The first award of the newly created Schumpeter Memorial Prize has been made to Professor Ragnar Frisch, of the University of Oslo, Norway, in recognition of his numerous pathbreaking achievements in the fields of economic theory, statistics, and econometrics

Recently elected officers of the Metropolitan Economic Association, New York City, are: president, Nilan Norris, Hunter College; vice-president, C. Lowell Harriss, Columbia University; secretary, Miriam Civic, National Industrial Conference Board; treasurer, Mildred Rendl, General Electric Company.

Deaths

Helen Baker, associate director, Industrial Relations Section, Princeton University, died January 10, 1955.

Walter E. Clark, president of the University of Nevada from 1917 to 1938, died May, 1955.

Bernard H. Hartzell, of Youngstown, Ohio, died January 9, 1955.

Archibald J. Nichol, associate professor of economics in the Wharton School of Finance and Commerce, University of Pennsylvania, died April 18, 1955.

Daniel T. Selko died at Caernarvonshire, Wales, February 27, 1955.

Appointments and Registrations

John F. Adams has been promoted to professor of economics in the School of Business and Public Administration, Temple University.

Quincy Adams has been transferred from the Central Intelligence Agency to an economist post with the Federal Trade Commission

John S. Almeida has been appointed instructor in the College of Business Administration, University of Florida

William H Andrews, Jr., has been promoted from assistant professor to associate professor at Indiana University

Ellis Austin, of Michigan State University, has been appointed assistant professor of economics at the University of Pittsburgh

George Babilot, Carnegie fellow, has been appointed instructor in economics at the University of Oregon.

L. Durward Badgley has been promoted to the position of director of real estate and mortgage research in the Mutual Life Insurance Company of New York

Stephen J. Barres has been appointed instructor in economics at Texas Western College, University of Texas

David W. Belcher has been promoted from associate professor to professor in the School of Commerce, University of Wisconsin.

Philip W Bell, of Haverford College, has been appointed acting director of the International Finance Section, Princeton University. He will serve half-time at Princeton and half-time at Haverford.

Michael H. Belshaw has been appointed lecturer in economics at Barnard College for the current academic year.

Jack F Bennett has resigned as monetary affairs advisor in the Foreign Operations Administration to take a position in the Treasurer's department of the Standard Oil Company of New Jersey in New York

Floyd A. Bond has been selected to receive the Trustees' Distinguished Professorship Award for distinguished service, Pomona College.

Chelcie C. Bosland has been granted a year's leave of absence from Brown University to serve as visiting professor of economics at Northwestern University.

Thomas R. Bossort, Jr, has been promoted from assistant professor to associate professor of management in the School of Business, Indiana University

Elbert V. Bowden, formerly research associate in the University of Kentucky Bureau of Business Research, has been appointed instructor in the department of economics and business administration of Duke University.

Charles T. Bowen has been appointed superintendent of the Consolidated Community School District No. 3, Literberry, Illinois.

Howard R. Bowen, of Williams College, became president of Grinnell College as of July 1, 1955.

Raymond T. Bowman has been granted leave from the Wharton School of the University of Pennsylvania to serve as assistant director of the Bureau of the Budget.

S. E. Braden has been promoted from associate professor to professor of economics at Indiana University. He is also associate dean of the College of Arts and Sciences.

Robert E. Branson, formerly of the Agricultural Marketing Service of the Department of Agriculture, has been appointed associate professor of agricultural economics at Texas A & M College.

Elmer C. Bratt was awarded an honorary degree of doctor of laws at the June 1955 commencement of the University of Nebraska. He is spending the year 1955-56 in Ceylon on a Fulbright grant, making an evaluation of Ceylon's rural development program.

Andrew F. Brimmer, of Harvard University, has joined the research department of the Federal Reserve Bank of New York.

George H. Brown has resigned as professor of marketing in the School of Business, University of Chicago, to become manager of consumer research, Ford Division, Ford Motor Company.

D. H Buchanan, professor of economics, emeritus, has returned to teaching duties at the University of North Carolina for the fall semester.

Norman S. Buchanan, has resigned from the University of California to accept a position as director of the Division of Social Sciences of the Rockefeller Foundation.

Albert Buckberg has been appointed instructor in economics at the University of Michigan.

Orin E Burley has been appointed chairman of the department of marketing and foreign commerce in the Wharton School, University of Pennsylvania

Clarence N. Callender has retired from teaching in the Wharton School, University of Pennsylvania, where he had served as professor of business law.

William J Carson has been granted a leave of absence from the Wharton School, University of Pennsylvania, to serve as director of the National Bureau of Economic Research

Philip W Cartwright is acting executive officer of the economics department of the University of Washington for the current academic year

Hollis B Chenery has been promoted to associate professor of economics at Stanford University.

Sherrill Cleland, of Princeton University, has accepted an appointment as assistant professor of economics at the University of Richmond

Denzel C. Cline has served as acting head of the department of economics, Michigan State University, during the leave of Charles C Killingsworth.

John R. Coleman, of the Massachusetts Institute of Technology, has been appointed associate professor of economics at Carnegie Institute of Technology.

Alfred H. Conrad, of Harvard University, has been appointed assistant professor of economics at Northwestern University

John H. Cover is working on an Asian area study in the Bureau of International Relations of the University of California during the current academic year.

Harold G. Cutright has been appointed professor in the department of marketing, University of Pittsburgh.

Sherman Dallas has been appointed assistant professor, Indiana State Teachers College, Terre Haute.

Lance E. Davis has been appointed instructor in economics at Purdue University.

Karl de Schweinitz has been promoted to associate professor of economics at Northwestern University.

Frank T. de Vyver is retiring from Erwin Mills and is returning to full-time teaching in the department of economics and business administration at Duke University.

Daniel Diamond has been appointed instructor in economics in the School of Commerce, Accounts and Finance, New York University.

D. Lyle Dieterle has been appointed chairman of the accounting department, School of Business, Indiana University, succeeding A. L. Prickett.

William P. Dillingham, of Florida State University, served as a consultant to the Presidential Commission on Veterans Affairs during the summer of 1955.

Evsey D. Domar has been promoted to professor of political economy at the Johns Hopkins University.

Robert Dorfman has resigned from the University of California to take a post as associate professor of economics at Harvard University.

H. M. Douty, chief of the Division of Wages and Industrial Relations, Bureau of Labor Statistics, has received a Rockefeller Public Service Award. He is spending this year abroad, principally at the London School of Economics, engaged in research into problems of wage determination and employment.

C. L. Dunn has been promoted to associate professor of accounting at Louisiana State University.

John S. Dydo, of the University of California, has been appointed instructor in economics at Vassar College for the current year.

Richard A. Easterlin is on leave from the Wharton School, University of Pennsylvania, to serve as research associate at the National Bureau of Economic Research.

Nylen W. Edwards has been appointed assistant professor of transportation at the University of Missouri.

Harry Ernst has been appointed assistant professor of economics at Tufts University

Alexander Firfer is economic consultant to the Administración de Fomento Económico of Puerto Rico on problems of industrial economics, small business and public utilities.

William A. Frank has accepted a position in the office of the executive vice president and general manager, Sperry Gyroscope Company, Great Neck, N.Y.

Charles Gilbert has been promoted from instructor to assistant professor of economics in the School of Commerce, Accounts, and Finance, New York University.

Marion H. Gillim has been appointed executive officer of the department of economics, Barnard College.

William E. Gordon has accepted an appointment as instructor in economics at Marquette University.

Amor Gosfield has been appointed lecturer in the economics department, University of Pittsburgh.

Frank M. Graner has been promoted from associate professor to professor in the School of Commerce, University of Wisconsin.

David Green has been promoted to assistant professor of business administration in the School of Business, University of Chicago.

Geza B. Grosschmid has been promoted from associate professor to professor of economics at Duquesne University.

Morton C. Grossman has been promoted to associate professor of economics at the State College of Washington.

Joseph R. Guerin has been appointed instructor in economics in the Wharton School, University of Pennsylvania.

F. J. Guerra has resigned from Louisiana State University to accept a position in the School of Commerce, St. Louis University.

Harold W. Guthrie has been promoted to assistant professor of economics at Yale University.

Paul N. Guthrie has assumed the chairmanship of the department of economics at the University of North Carolina.

Wayne W. Guthrie has been appointed assistant professor of marketing at the University of Idaho.

James K. Hall was on leave from the University of Washington in the spring term to serve on an assignment with the Foreign Operations Administration in Vietnam as economic consultant on tax and budget problems.

J. Whitney Hanks has been promoted from associate professor to professor of economics at the University of Utah.

Louis T. Harms has been promoted to assistant professor in the School of Business and Public Administration, Temple University.

Seymour E. Harris has been appointed chairman of the department of economics, Harvard University. He will continue to serve as chairman of the New England Governors' Textile Committee and as adviser to the New England Governors with respect to the effect of federal economic policies upon the New England economy.

C. Lowell Harriss, of Columbia University, is serving as consultant to the City Administrator, New York City, studying problems of local business taxation.

Douglas Hartle has resigned as instructor in the department of economics and business administration at Duke University.

Milton S. Heath has been appointed chairman of graduate studies and research in the areas of economics and business administration at the University of North Carolina.

John Henderson has been appointed assistant professor in the economics department, University of Pittsburgh.

James B. Hendry has been appointed instructor in economics at Michigan State University.

Bert G. Hickman has resigned from Northwestern University to join the staff of the Brookings Institution.

R. J. Hildreth, formerly of Iowa State College, has been appointed assistant professor of agricultural economics at Texas A & M College

George W. Hilton has been appointed instructor in economics at Stanford University

J. E. Hipp has been appointed instructor in the College of Business Administration at the University of Florida.

Ralph C. Hoeber, of the University of Hawaii, has accepted a year appointment as lecturer in business law in the School of Business Administration, University of California, Los Angeles.

Charles T Horngren has resigned from the School of Business, the University of Chicago, to become assistant professor of accounting at Marquette University.

Hendrik S Houthakker has been appointed associate professor of economics at Stanford University.

William M. Howard has accepted an appointment as associate professor in the College of Business Administration at the University of Florida.

James E. Howell has been appointed instructor in economics at Yale University.

Richard Huber is on leave from the University of Washington to serve as Fulbright lecturer at Nagoya University in Japan.

Grover G. Huebner has retired from the Wharton School, University of Pennsylvania, where he had served as professor of commerce and transportation and as chairman of the marketing and foreign commerce department.

H. W. Huegy has been appointed head of the marketing department of the University of Illinois, succeeding P. D. Converse.

John M. Hunter, of Michigan State University, is in Saigon, Vietnam, as a specialist in international trade under a technical assistance contract between Michigan State and the Foreign Operations Administration.

Patrick Huntley has been appointed instructor in the department of economics and business administration of Duke University.

John Ise, who retired from the University of Kansas in June, is teaching at Goucher College in the current academic year.

John E. Jeuck has resigned as dean of the School of Business, University of Chicago, to become professor of business administration at Harvard Graduate School of Business Administration.

Harry G. Johnson, of Kings College, Cambridge, was visiting professor of economics at Stanford University in the summer quarter.

Howard Johnson has resigned from the University of Chicago to become associate professor of industrial management and director of the Executive Development Program in the School of Industrial Management, Massachusetts Institute of Technology.

Paul V. Johnson has been appointed instructor in economics at Western Reserve University.

Matthew H. Jonas has been appointed instructor in economics at the University of Texas.

C. Clyde Jones, formerly of the University of Georgia, has been appointed assistant professor of economics at the University of Illinois

Robert M. Kamins has been promoted from associate professor to research professor in the economics department and to the directorship of the Legislative Reference Bureau at the University of Hawaii.

Samuel T. Keim has resigned from Texas A & M College to become chairman of the department of business administration at Kansas State College.

Eugene J. Kelley has been promoted from assistant professor to associate professor of economics at Clark University.

Charles C. Killingsworth has been designated coordinator of Michigan State University's technical assistance program for Vietnam under contract with the Foreign Operations Administration

Wylie Kilpatrick has been granted six months' leave from the University of Florida to act as fiscal consultant to the Northern Virginia Regional Planning Commission in Arlington, Virginia.

Martin L. King has been appointed assistant professor of commerce at the University of Kentucky

Peter S King has resigned from the School of Business, Indiana University, to accept a position at the Massachusetts Institute of Technology.

Lawrence R. Klein has been appointed professor of economics, and continues as research associate in the Institute for Social Research, at the University of Michigan.

Paul L Kleinsorge, of the University of Oregon, is doing research this year at Kobe University, Japan

R S. Kline, of the University of Georgia, has been appointed associate professor in the College of Business Administration, University of Florida

W. Donald Knight, director of the Bureau of Business Research and Service in the School of Commerce at the University of Wisconsin, has been promoted to the rank of full professor.

Anthony Y. Koo has been promoted to associate professor of economics at Michigan State University.

William Korbel has resigned from the University of Kansas to join the marketing research division of Telechron Company.

Irving B. Kravis has been named chairman of the economics department of the Wharton School, University of Pennsylvania.

Clifton H. Kreps, Jr., has been appointed Wachovia associate professor of banking at the University of North Carolina.

C. Arthur Kulp has been named dean of the Wharton School, University of Pennsylvania.

Ernest Kurnow, now on leave serving the Foreign Operations Administration in Ankara, Turkey, has been promoted from associate professor to professor of economics in the School of Commerce, Accounts and Finance at New York University.

David T. Lapkin has been promoted to associate professor of economics at the State College of Washington.

Robert G. Layer has resigned from Texas A & M College to become acting chairman of the department of economics at Southern Illinois University.

Don E. Leatherman has been appointed faculty lecturer in management in the School of Business, Indiana University.

Wayne A. Leeman has been promoted to associate professor of economics at the University of Missouri.

Mark W. Leiserson has been promoted to assistant professor of economics at Yale University.

J. D. Leonard has resigned as instructor in economics at Purdue University.

Enrique Lerdau, of the University of Wisconsin, has been appointed instructor in economics at Carnegie Institute of Technology.

Eugene M. Lerner, of the University of Idaho, has been appointed a research associate with the National Bureau of Economic Research for the current year.

Harold L. Levinson has been promoted to associate professor of economics at the University of Michigan.

Richard W. Lindholm is in Saigon, Vietnam, as a specialist of public finance under a technical assistance contract between Michigan State University and the Foreign Operations Administration.

Justin G. Longenecker has joined the faculty of Baylor University as associate professor of management.

Kullervo Louhi has been promoted to associate professor of accounting in the School of Business of the University of Chicago.

Ronan G. MacDonald has been promoted to assistant professor of economics at Fordham University.

Maurice C Mackey has been appointed assistant professor of economics at the University of Illinois.

C Ward Macy, of the University of Oregon, was a Fulbright lecturer on contemporary economic policy at the Conference on American Studies, Oxford University, in the summer of 1955.

Everett J. Mann has resigned from the department of economics and business administration at Duke University.

Fritz Karl Mann, of American University, taught at the University of Cologne during the summer semester.

Jacob Marschak, of Yale University, is a fellow of the Ford Center for Advanced Study in the Behavioral Sciences, Stanford, California, during the current year.

Howard Marshall is on leave from Vassar College this year and is teaching at Wesleyan University.

Joseph L. Massie has been appointed assistant professor of business administration in the School of Business, University of Chicago.

Leonard G. Mathy has been promoted to professor of economics at Los Angeles State College.

Donald J. McClurg has been appointed instructor in economics at the University of Texas.

L. W. McKenzie, of Duke University, will spend the spring semester of 1956 at Yale as a guest of the Cowles Commission.

Taylor W. Meloan has been promoted from assistant professor to associate professor of marketing in the School of Business, Indiana University.

John R. Meyer has been appointed assistant professor of economics at Harvard University.

Robert R. Milroy has been promoted from associate professor to professor of accounting in the School of Business of Indiana University.

Robert Minton, recently research associate in the University of Kentucky Bureau of Business Research, has accepted a teaching position at Memphis State College.

R. V. Mitchell has been granted a semester's leave from the University of Illinois to do consulting work with the firm of Alderson & Sessions in Philadelphia.

Clarence A. Moore, formerly of the University of Chicago, has been appointed assistant professor of agricultural economics at Texas A & M College.

David G. Moore has been appointed associate professor of business administration and director of the Executive Program in the School of Business, University of Chicago.

Theodore Morgan has been promoted from associate professor to professor of economics at the University of Wisconsin. He is currently on leave to complete a research project on the economic development of Ceylon.

Irving A. Morrissett, of the Survey Research Center of the University of Michigan, has been appointed assistant professor of economics at Purdue University.

John F. Muth has been appointed instructor in economics at Carnegie Institute of Technology.

Richard Muth has been appointed lecturer in political economy at the Johns Hopkins University.

M. J. Nadworny has been promoted to associate professor in the department of commerce and economics at the University of Vermont

William H. Nicholls served as technical director of the seventh American Assembly, Graduate School of Business, Columbia University, on "United States Agriculture: Perspective and Prospects," which met in May, 1955.

Elbert A. Nyquist has been promoted to assistant professor in the department of commerce and economics of the University of Vermont

Clinton L. Oaks has resigned from the University of Utah to accept a position in the marketing department of the University of Washington.

Thomas J. Orsagh, formerly instructor in finance, has been appointed instructor in economics in the Wharton School, University of Pennsylvania

Robert C. Ortner has been appointed instructor in statistics at the Wharton School, University of Pennsylvania.

J. M. Owen has been promoted to associate professor of accounting at Louisiana State University.

James W. Parsons, Jr., of Louisiana State University, has accepted an appointment as associate professor of accounting and statistics at Baylor University

James Parthemos has been appointed instructor in the department of economics and business administration of Duke University

Don Patinkin has been appointed visiting lecturer in the department of political economy at the Johns Hopkins University for the current academic year.

Robert T. Patterson has resigned from New York University to accept an appointment as associate professor of public finance at Claremont Men's College.

Merton J. Peck, of Harvard University, has been appointed assistant professor of economics at the University of Michigan.

Mark Perlman has been appointed assistant professor of political economy at the Johns Hopkins University.

William S. Peters, formerly of the Wharton School, University of Pennsylvania, has accepted a position in the School of Business Administration of the University of Montana.

Thomas A. Petit, of the University of California, Berkeley, has accepted an appointment as acting assistant professor of marketing in the School of Business Administration and assistant research economist in the Bureau of Business and Economic Research at the University of California, Los Angeles, for the year 1955-56.

Robert B. Pettengill has accepted a year appointment as visiting professor of economics at Oberlin College.

Giulio Pontecorvo has been appointed associate in economics for the year 1955-56 in the department of economics of the University of California, Berkeley.

Rudolph A. Postweiler has been appointed assistant professor of economics at the University of Idaho.

Hoyt Price has been assigned to the Bureau of Far Eastern Affairs, Department of State as international economist

A. L. Prickett has resigned as chairman of the accounting department in the School of Business, Indiana University, but is continuing to serve as professor of accounting.

Malcolm L Pye has been appointed assistant professor in the College of Business Administration of the University of Florida.

Leonard Rall, of Michigan State University, is serving as professor of economics in the School of Business at Sao Paulo, Brazil, under a technical assistance contract between the Foreign Operations Administration and Michigan State University.

J. W. Reddoch has been promoted to assistant professor of business administration and assistant to the dean, Louisiana State University

Curtis Reierson, Jr., has been appointed assistant professor of marketing at Baylor University.

Stewart H Rewoldt has been promoted from assistant professor to associate professor of marketing in the School of Business of Indiana University.

J. Henry Richardson, Burton Montague Professor of Industrial Relations at the University of Leeds, England, has been appointed visiting professor of economics at the University of California, Berkeley, for the current academic year.

L. Victor Riches has resigned from the University of Utah to accept a position with the Stanford Research Institute.

Lawrence S. Ritter is on leave from Michigan State University to conduct a research study for the Federal Reserve Bank of New York.

Frank G. Rizzardi has resigned from the General Motors Institute to accept an appointment as assistant professor of accounting at the University of Idaho.

David R. Roberts, formerly of Carnegie Institute of Technology, has been appointed dean of the College of Business Administration of Butler University

Harry V. Roberts has been promoted to associate professor of statistics in the School of Business of the University of Chicago.

W. Clyde Robinson has been appointed assistant professor of economics at Baylor University.

Charles E. Rollins has been appointed assistant professor of economics at Stanford University for the current year.

Nathan Rosenberg, of the University of Wisconsin, has been appointed lecturer in the department of economics, Indiana University, for the current academic year.

Marvin E. Rozen has been appointed instructor in economics at Stanford University

Roy J. Sampson has been promoted to associate professor in the department of business administration at Pacific University.

Raymond J. Saulnier is on leave from Barnard College to serve as a member of the Council of Economic Advisers.

Joseph C. Schabacker has accepted an appointment as lecturer in business administration in the School of Business Administration, University of California, Los Angeles, for the current year.

Leon M. Schur has been promoted to assistant professor of business administration at Louisiana State University.

Sherman Shapiro, formerly of the University of Texas, has been appointed assistant professor of economics at Notre Dame University.

Ansel Sharp has resigned from Louisiana State University to accept a position at William Jewell College.

John A. Shubin has been promoted from assistant professor to associate professor of economics in the School of Commerce, Accounts and Finance, New York University.

Paul B. Simpson, formerly economist with the Federal Reserve Board of Governors in Washington, D.C., has been appointed professor of economics at the University of Oregon.

Joe Small has been appointed assistant professor of economics and business administration at Lafayette College.

A. Frederick Smith is acting assistant regional director of the Urban Renewal Administration, Housing and Home Finance Agency, Atlanta, Georgia

Vernon L. Smith has been appointed assistant professor of economics at Purdue University.

Ezra Solomon has been promoted to associate professor of finance in the School of Business of the University of Chicago.

Lewis C. Sorrell, of the University of Washington, has accepted a visiting professorship in management theory and transportation for the current academic year in the School of Business Administration, University of California, Los Angeles.

Donald M. Soule, formerly of Humboldt State College, has been appointed assistant professor of economics at the University of Illinois

Jared Sparks, Jr., has been appointed instructor in economics at Purdue University.

William F. Stanton, Jr., of the University of California, has accepted an appointment as acting assistant professor of business law in the School of Business Administration, University of California, Los Angeles, for the current academic year

Robert W. Strain has resigned from Indiana University to accept a position at the University of Texas

James H Street has been promoted to associate professor of economics at Rutgers University.

Paul Streeten has been appointed fellow in political economy at the Johns Hopkins University for the term beginning February 1956

Daniel B. Suits has been promoted to associate professor of economics at the University of Michigan.

Theodore A. Sumberg has accepted a six-month appointment as advisor on monetary policy to the Central Bank of Guatemala.

Theo Suranyi-Unger, of Syracuse University, was visiting professor at the University of Munich, Germany, in the summer of 1955.

Floyd Swann has been appointed instructor in the School of Business Administration management department at the University of Miami

Milton C. Taylor, formerly of Marquette University, has joined the staff of the department of economics of the University of Wisconsin to work on an income tax study as a project associate.

Ralph I. Thayer has been appointed chairman of the department of economics at the State College of Washington.

William J. Thomas, associate professor of statistics and economics, has been named director of the Bureau of Business and Economic Research, Baylor University.

Kenneth Thompson is on leave from Louisiana State University this year to serve on the staff of the University of Maryland in its European program of college training for members of the U. S. Armed Forces

Howard L. Timms has been promoted from faculty lecturer to associate professor of management in the School of Business, Indiana University.

Raymond R. Toledo has been appointed associate professor of business administration for the current year at the Immaculate Heart College of Los Angeles.

Leland E. Traywick has been designated assistant coordinator of Michigan State University's technical assistance program for Vietnam which is being carried on under contract with the Foreign Operations Administration.

Bertrum Trillich, of Texas Christian College, has been appointed assistant professor of marketing in the School of Business, University of Kansas.

Roy E. Tuttle has resigned from the University of Utah to accept a position at the University of Wisconsin.

Bernard Udis, of Princeton University, has accepted an appointment as assistant professor at the University of Tennessee.

Lyndall Urwick, an internationally known authority in the field of management, delivered five of the University of Minnesota Merrill Foundation Lectures in April and May.

Stefan Valavanis, of the University of Michigan, has been appointed assistant professor of economics at Northwestern University.

R. S. Van de Woestyne, professor of business administration, has been appointed acting dean of the School of Business, University of Chicago.

William F. Vendley has been promoted from associate professor to professor of accounting at Purdue University.

Peter Vukasin has been appointed visiting assistant professor of economics at Cornell University

Robert F. Wallace has been promoted to professor of economics at the State College of Washington.

Richard J Ward has been promoted to assistant professor of economics at Fordham University.

William J. Watkins has been appointed faculty lecturer in marketing in the School of Business, Indiana University.

Paul Weiner has been appointed instructor at Denison University

Philip Wernette, of the University of Michigan, made a lecture tour of South American capitals in the spring of this year, at the invitation of the U S. State Department. His lectures were on the topics of the Future Economic Progress of Latin America and Capitalism versus Communism.

Howard S. Whitney, formerly of Oklahoma A & M College, has been appointed assistant professor of agricultural economics at Texas A & M College.

Richard C. Wilcock has been promoted to associate professor of labor and industrial relations in the Institute of Labor and Industrial Relations, University of Illinois.

Edgar Williams has been promoted from assistant professor to associate professor of management in the School of Business, Indiana University.

Rufus Wixon, of the accounting department of the Wharton School, University of Pennsylvania, is serving as associate chief of party, Institute of Public and Business Administration, University of Karachi, Pakistan.

Thomas A. Yancey has been appointed instructor in the department of economics, University of Illinois.

Edwin Young has been promoted from associate professor to professor of economics at the University of Wisconsin. He is on leave this year to study international economic organizations in Brussels on a Ford grant.

John H. Young has been promoted to assistant professor of economics at Yale University

FIFTY-SECOND LIST OF DOCTORAL DISSERTATIONS IN POLITICAL ECONOMY IN PROGRESS IN AMERICAN UNIVERSITIES AND COLLEGES

The present list specifies doctoral degrees conferred during the academic year terminating June 1955, and theses undertaken in the same period. In the latter category the year following the dissertation title is the probable date of completion.

Economic Theory; General Economics

Degrees Conferred

GARY S. BECKER, Ph.D. Chicago 1955. Discrimination: A theoretical and statistical study.

MARK BLAUG, Ph.D. Columbia 1955. The evolution of Ricardian economics in England.

RUSSELL A. HEADLEY, Ph.D. Pennsylvania 1955. Pessimism in economic thought.

JAMES M. HENDERSON, Ph.D. Harvard 1955. A short-run model for resources: with applications for coal.

JOHN H. HOAGLAND, Ph.D. Ohio State 1954. Charles Babbage, 1792-1871—industrial analyst.

CHIA CHUN HUNG, Ph.D. Washington 1955. A classification of market structures: theory and empirical implications.

BRYCE J. JONES, Ph.D. St. Louis 1955. Theories of economic stagnation.

LIONEL LERNER, Ph.D. Johns Hopkins 1955. Theories of imperialist exploitation.

BERTRAM F. LEVIN, Ph.D. Wisconsin 1955. Theories of the real rate of interest.

CH'UNG TAI LU, Ph.D. Maryland 1954. Elements of a theory of economic development of underdeveloped countries: a generalization of projected patterns of economic development in countries surveyed by the International Bank for Reconstruction and Development.

HOWARD T. LUDLOW, Ph.D. Fordham 1955. The Malthusian controversy: history of the theory of population in English economics from Malthus to Mill.

MOTHER RAYMOND MCKAY, Ph.D. Fordham 1955. Some similarities in the economic thinking of Sir James Steuart and John Maynard (Lord) Keynes.

LAWRENCE NABERS, Ph.D. California 1954. Alfred Marshall's system of economic reform.

SISTER MARY SILVERIUS SHIELDS, R.S.M., Catholic 1955. Some Irish contributions to the history of economics.

VERNON L. SMITH, Ph.D. Harvard 1955. A theoretical and empirical inquiry into the economic replacement of capital equipment.

RICHARD SPANGLER, Ph.D. California (Los Angeles) 1955. Reconsideration of short-run wage theory.

JEROME L. STEIN, Ph.D. Yale 1955. Economic theory and industrialization arguments.

ROBERT F. VOERTMAN, Ph.D. Texas 1955. Market expansion and economic development.

PINKNEY C. WALKER, Ph.D. Pennsylvania 1955. The interest theories of Böehm-Bawerk, Fisher and Keynes: a critique.

WILLIAM WARNTZ, Ph.D. Pennsylvania 1955. The geography of price—an attempt to develop a theory of the geographical variation of price using concepts measuring the space and time dimensions of certain economic phenomena.

Theses in Preparation

ROBERT E. BARCKLEY, B.S.C. North Dakota 1949; M.A. Columbia 1950. Theories of economic growth. 1955. *Illinois*.

RALPH B. BRISTOL, JR., B.A. Amherst 1952; M.A. Yale 1953. An investigation of the phenomenon of quality variation 1956. *Yale*.

JOSEPH CAMMOROSANO, B.S. Fordham 1947; M.A. New York 1949. Keynes' contribution to international trade theory 1956. *Fordham.*

EDWARD J. COOK, B.S. Fordham 1949; M.A. Columbia 1950. Macro-economic implications of the betterment factor. 1956. *Fordham.*

GEORGE DALTON, B.A. Indiana 1950; M.A. Columbia 1951. Resource allocation under central planning: a theoretical critique. 1956. *Oregon.*

LORETTA DUNPHY, B.C.S. Drake 1948; M.A. Catholic 1950. Simon Newcomb: his contribution to economic thought. 1956. *Catholic.*

FRED L. GLIMP, JR., B.A. Harvard 1950. Economic development theory and international trade theory. 1956. *Harvard.*

JOHN P. HENDERSON, B.A. California 1944. David Ricardo's theory of value as the classical macro theory of production. 1955. *Maryland.*

LIONEL W. MCKENZIE, JR., B.A. Duke 1939; M.A. Princeton 1946. Application of activity analysis to the theory of general equilibrium. 1956. *Princeton*

JOHN M. B. MOSS, B.A. Trinity (Cambridge) 1952. Theory of capital and interest. 1956. *Mass. Inst. of Technology.*

RICHARD R. NELSON, B.A. Oberlin 1952; M.A. Yale 1953. A theory of the nature of low level equilibrium in underdeveloped areas. 1956. *Yale.*

BERNARD NEWTON, B.B.A. City (New York) 1944. The economics of Francis Amasa Walker: American economics in transition. 1957. *Columbia.*

JOSEPH NORMILE, B.S. Cornell 1948; M.A. Catholic 1951. Analysis of the economic theories of Richard Ely and his contribution to the development of economic science in the United States. 1957. *Catholic.*

BERNARD OKUN, B.A. Brooklyn 1953. A theoretical and empirical study of the pricing and production policies of the multi-product firm. 1956. *Johns Hopkins.*

KYOHEI SASAKI, M.A. Tokyo Imperial 1944. Western influence on Japanese economic thought from 1920 to 1930. 1957. *Columbia.*

C. MERYL SULLIVAN. Role of standardization in modern consumption theory. 1956. *Georgetown.*

BENJAMIN T. TEETER. The stable share ratio. 1955 *Georgetown.*

PETER R. TOSCANO, M.A. Chicago 1951. Economic thought in Milan and Tuscany, 1737-1800. *Chicago.*

WILLIAM H. TRUMBO, B.A. Southeast Missouri State Teachers 1947; M.A. Missouri 1950. The measurement of monopoly. 1955. *Colorado*

FRANK ULLRICH, B.A. Innsbruch 1937; M.A. Fordham. The significance of Johann Karl Robertus in 19th century and contemporary economic thought. 1956. *Fordham*

FRANKLIN V. WALKER, B.A. California 1950; M.A. Harvard 1954. The criticism of the concept of balanced growth in economic development. 1955. *Harvard.*

SHENG-WU WANG, B.A. Nat. Tsin Hua (China) 1943; M.A. Missouri 1951. Development of capital theory. 1957. *Wisconsin.*

ROBERT M. WILL, B.A. Western Ontario 1953; M.A. Duke 1955. The development of economic science in Chile. 1956. *Duke*

JAMES G. WITTE, B.A. Knox 1952; M.A. Indiana 1954. Automatic production and unemployment: A theoretical analysis. 1956. *Indiana.*

EDWARD J. ZABEL, B.A. Syracuse 1950; M.A. Princeton 1953. The concept of capacity 1956. *Princeton.*

ARNOLD ZELLNER, B.A. Harvard 1949. Innovations and economic growth. 1956. *California*

Economic History; National Economies; Economic Development

Degrees Conferred

JAHANGIR AMOUZEGAR, Ph.D. California (Los Angeles) 1955. Iran and the Point Four program.

JOHN H. AUTEN, Ph.D. Mass. Inst. of Technology 1955. New Zealand and cyclical dependence, 1920-1939.

RAGHBIR S. BHATIA, Ph.D. Columbia 1955. The role of foreign investments in the economic development of India.

LEO V. BONNETT, George Washington 1955. Foreign exchange availability and Indian economic development.

ALICE E. BOURNEUF, Ph.D. Harvard 1955. Financing the Norwegian post-war investment program and the elimination of suppressed inflation.

MAURICE L. BRANCH, Ph.D. Wisconsin 1954. The paper industry in the lake states region, 1834-1947.

ESME Y.-Y. CHU, Ph.D. Radcliffe 1955. Economic development in Malaya: the problem in a plural society.

FINLEY M. CHU (FENG MING), Ph.D. Wisconsin 1955. China's old culture and new order.

DAVID C. CORBETT, Ph.D. McGill 1954. Immigration, population growth and the economic development of Canada.

H. JEROME CRANMER, Ph.D. Columbia 1955. The New Jersey canals: a study of the role of government in economic development.

HOWARD R. DELANCY, D.B.A. Indiana 1954. History of the Cole Motor Car Company.

DAVID FELIX, Ph.D. California 1955. Industrialization and chronic inflation in underdeveloped countries.

PAUL E. FENLON, Ph.D. Florida 1955. The struggle for control of the Florida Central Railroad (1867-1882): a case study of business enterprise in post-Civil War Florida.

JAMES P. GITTINGER, Ph.D. Iowa (Ames) 1955. Economic development through agrarian reform.

WILLIAM P. GLADE, JR. Ph.D. Texas 1955. The role of government enterprise in the economic development of underdeveloped regions. Mexico: a case study.

LOUIS-MARIE GOREUX, Ph.D. Chicago 1955. Agricultural productivity and economic development in France (1852-1950)

SAMUEL GOTTLIEB, Ph.D. Columbia 1955. The role of international specialization in the economic development of Turkey.

ISRAEL KUGLER, Ph.D. New York 1954. The woman's rights movement and the national labor union (1866-1872).

BENITO F. LEGARDA, JR, Ph D. Harvard 1955. Foreign trade, economic change and entrepreneurship in the 19th century Philippines.

LELAND SUNG LIANG, Ph.D. Pennsylvania 1955. Problems of the cotton manufacturer in China.

TAGHI MORTAZAVI, Ph.D. Wisconsin 1955. Government in the economy of Iran 1925-1942.

KENJI OKUDA, Ph.D. Harvard 1955. The industrial development program in Puerto Rico, 1942-53.

ADAMANTIOS PEPELASIS, Ph.D. California 1954. Socio-cultural barriers to the economic development of Greece.

CHARLES E. ROLLINS, Ph.D. Stanford 1955. Raw materials development and economic growth: a study of Bolivian and Venezuelan experience.

WILLARD D. SHARPE, Ph.D. Harvard 1955. The economic policies of the popular front governments of France, 1936-38.

MORRIS SINGER, Ph.D. California 1955. Case studies in the policies of economic development: the experiences of New Zealand and Japan.

PEDRO C. M. TEICHERT, Ph.D. Texas 1955. Industrial development policy in Uruguay.

SYLVIA WISEMAN, Ph.D. McGill 1954 Planning of underdeveloped areas.

GENE L. WUNDERLICH, Ph.D. Iowa (Ames) 1955. The Bombay Tenancy and Agricultural Lands Act as a means of agrarian reform.

TARO YAMANE, Ph.D. Wisconsin 1955. Post-war inflation in Japan.

Theses in Preparation

RIBHI ABU EL-HAJ, B.A. American (Beirut) 1950; M.A. California (Los Angeles) 1951. Oil industry: a strategic factor in the economic development of Iraq. 1956. *Columbia.*

WALTER ADAMSON, B.A. New York 1939; M.A. 1940; M.A. Fletcher School Law and Diplomacy 1953. A study in economic development. 1957. *Fletcher School Law and Diplomacy.*

ABDUL SAHIB ALWAN, B. Com. Baghdad 1951; M.A. California (Los Angeles) 1953. Land policy and economic development in Iraq. 1956. *Wisconsin.*

MOIN UDDIN BAQUI, B.A. Islamia (India) 1950; M.A. Punjam (India) 1952. The general theory of fiscal and monetary controls as modified in their application to conditions in underdeveloped countries; with particular reference to Pakistan. 1956. *Kansas.*

ROY J. CAMERON, B.Ec. Adelaide (Australia) 1948; M.A. 1951. Inflation in a dependent economy: Australia, 1945-52. 1956. *Harvard.*

HENRY P. CAULFIELD, B.S. Harvard 1940; M.P.A. 1949. British iron and steel industry. *Harvard.*

CHARLES CONKLIN, B A. Waynesburg 1941; M.A. Pittsburgh 1950. Economic history of the northern sections of the West Virginia pan-handle. 1956. *Pittsburgh.*

MARY E. CRAIG, B.A. North Carolina 1947; M.A. 1950. A history of the North Carolina furniture industry with special reference to locational factors. 1956. *Duke*

LANCE E. DAVIS, B.A. Washington 1952; M.A. 1953. The sources of finance for American industry prior to the Civil War. 1956. *Johns Hopkins.*

NORTON T. DODGE, B.A. Cornell 1948; M.A. Harvard 1951. The Soviet tractor industry and the mechanization of agriculture. 1955. *Harvard.*

HAROLD B. EHRLICH, B.A. Rutgers 1950; M.A 1951. Planning under nationalization: British theory and practice. 1956 *Rutgers.*

DONALD A. FINK, B.A. Yale 1952; M.A. 1954. The economic significance of technological innovation at the Inland Steel Company since 1900. 1956. *Yale.*

MILTON L. GLICK, B.A. New York 1949; M.A. Chicago 1951. The effects of economic development on the returns to labor in Mexican agriculture. *Chicago.*

SONIA GOLD, B.A. Hunter 1938. Role of government in private enterprise as evidenced by programs of the World Bank. 1956. *Pittsburgh.*

LEON HOLLERMAN, B.A. Rochester 1939. Viability of the Japanese economy, with special consideration of international trade problems. 1957. *California.*

CONRADO E. HUNTER, B.S. McGill 1951; M.A. Harvard 1953. Canada's conduciveness to Latin American economic development. *Harvard.*

WILLIAM L. IVEY, B.S. Alabama Poly. Inst. 1948; M.S. North Carolina 1951. American labor and national issues 1827-1954. 1956. *North Carolina.*

NANCY J. KENNEY, B.A. Swarthmore 1951; M.A. Fletcher School Law and Diplomacy 1953. The economic ideas of Gandhi and Indian economic planning. 1957. *Fletcher School Law and Diplomacy.*

FREDERICK V. LOUD, B.A. Harvard 1929. Mobilization of development finance in the Arab Middle East. 1957. *Columbia.*

RAGAEI WM. EL MALLAKH, B.C. Fouad (Egypt) 1949; M.A. Rutgers 1951. Effects of the second world war on the economic development of Egypt. 1955. *Rutgers.*

RUTH L. METZGER, B.A. Bryn Mawr 1950. French monetary problems and policies since 1945. 1956. *Harvard.*

BENJAMIN A. MICHALIK, B.A. St. Joseph 1940; M.A. Fordham 1942. The Lehigh Coal and Navigation Company 1913-53. An economic analysis of the anthracite coal industry. 1956. *Fordham.*

JOHN J. MURPHY, B.A. Catholic 1952; M.A. Yale 1954. The foundation and development of two Massachusetts waterpower industrial valleys: a comparative historical study. 1956. *Yale.*

FREDERICK T. NEELY, B.S. Virginia 1950; M.A. 1951. Financial history of Virginia, 1776-1861. 1956. *Virginia.*

OM PRAKASH NIJHAWAN, B.A. East Punjab (India) 1950; M.A. Nebraska 1954. A pragmatic framework for the industrialization of India. 1956. *Nebraska.*

PIUS N. OKIGBO, B.A. London School of Economics 1946; B.S. 1949. Capital formation and economic development in Nigeria. 1956. *Northwestern.*

H. A. OLUWASANMI, B.A. Morehouse 1951. Nigerian agriculture: a study in farming organization with special reference to technical and economic development. 1955. *Harvard.*

BERNARD Z. ORZECH, B.S. California 1950. The role of economic fluctuations in the growth of the German economy, 1873-1914. 1957. *California.*

ALGIMANTAS PETRENAS, Dipl. rer. pol. Hamburg 1949. The process of economic growth in a controlled economy. 1957. *Columbia.*

GEORGE M. POWELL, B.A. Arkansas 1950; M.A. Minnesota 1951. Use of commercial policy for economic development in selected countries. 1955. *Illinois.*

GUSTAV RANIS, B.A. Brandeis 1952; M.A. Yale 1953. Japan—capital accumulation and economic development. 1956. *Yale.*

RONALD G. RIDKER, B.A. California 1952; M.A. Fletcher School Law and Diplomacy 1953. Developmental planning in Norway. 1957. *Wisconsin.*

GASTON V. RIMLINGER, B.A. Washington 1951. A comparative study of the pattern of trade union formation in the beginning of industrialization in the U. S., England, France, Germany and Russia. 1956. *California.*

SHELDON SCHAFFER, B.A. Iowa 1943; M.A. Yale 1947. Adjustment to technological product change; an industrial history of the Graton and Knight Company. 1956. *Yale.*

HUBERT SCHIFFER, S.J., Lic. St. Miki (Japan) 1945; M.A. Fordham 1952. Postwar reconstruction of the Japanese banking system. 1956. *Fordham.*

HANS O. SCHMITT, B.A. California 1952. The role of monetary policy in the economic development of southeast Asia. 1956. *California.*

SISTER GENEVIEVE LOUISE SHEEHAN, B.S. St. Rose 1937; M.A. Catholic 1944. A synopsis and evaluation of the theories dealing with the economic decline of Rome. 1956. *Fordham.*

BARRY SIEGAL, B.A. California 1951. Banking policy and economic development: case study of Mexico. 1956. *California.*

ROBERT G. SPIEGELMAN, B.S. California 1949; M.A. 1953. The role of the tariff in India's industrial development. 1956. *Columbia.*

W. PAUL STRASSMAN, B.A. Texas 1949; M.A. Columbia 1950. Risk and technological innovation in producers' goods, 1820-1885. 1956. *Maryland.*

STEFAN STYKOLT, B.A. Toronto 1946; M.A. Harvard 1949. British overseas investments as a factor in Canadian economic development. 1867-1913. *Harvard.*

PHILIP S. THOMAS, B.A. Oberlin; M.A. Michigan. Foreign capital in the economic development of India. 1957. *Michigan.*

STOKES M. TOLBERT, B.A. Yale 1948; M.A. Harvard 1950. Central banking and economic development: a case study of India. 1955. *Harvard.*

ROBERT L. WEST, B.A. Yale 1948; M.A. 1950. Kenya in the British Empire; problems of economic policy between the world wars. 1956. *Yale.*

ELMUS R. WICKER, B.A. Louisiana State 1946; M.A. 1948; B. Phil. Oxford 1951. The Colonial Development Corporation 1948-1953. 1955. *Duke.*

KUNG-CHIA YEH, LL.B. National Tsing Hua (China) 1948; M.B.A. Columbia 1952. The changing structure of import trade in the course of economic development. 1957. *Columbia.*

Statistics and Econometrics

Degrees Conferred

ROBERT L. BASMANN, Ph.D. Iowa (Ames) 1955. Application of several econometric techniques to a theory of demand with variable tastes.

NATHAN GOLDFARB, Ph.D. New York 1955. Longitudinal statistics—their quality and application.

DELBERT C. HASTINGS, Ph.D. Minnesota 1954. A monthly index of regional business activity based on net product measurement.

JOHN R. MEYER, Ph.D. Harvard 1955. Business motivation and the investment decision: an econometric study of post-war investment patterns in the manufacturing sector.

Theses in Preparation

LOUIS P. CECCHINI, B.A. Wesleyan 1942; M.A. 1944. The historical development of time series analysis. 1957. *Catholic.*

ED. F. CRIM, B.S. Oklahoma 1943; M.S. Illinois 1953. Temporal relations among economic variables and contra-cyclical economic policy 1955. *Illinois.*

FREDERICK O'R. HAYES, B.A. Hamilton 1947; M.A. Harvard 1949; M.P.A. 1948. The time relation between input and output flows in investment goods industries. *Harvard.*

GEORGE W. LADD, B.S. South Dakota State 1950; M.A. Michigan State 1951. Regressions in econometric models under different assumptions concerning the nature of the data 1955. *Illinois.*

RICHARD E. QUANDT, B.A. Princeton 1952; M.A. Harvard 1955. Probability in economic theory and statistical inference in input-output analysis. 1956 *Harvard.*

THOMAS E YANCLY, B.S. Missouri 1948; M.A. 1949. Economic relations under different assumptions concerning price flexibility. 1955. *Illinois.*

Economic Systems; Planning and Reform; Cooperation

Degrees Conferred

MOHAMED ABD EL-WADOOD KHALIL, Ph.D. Wisconsin 1955 The relationship of the business cycle to the organization of cooperative associations.

Theses in Preparation

JOHN E. ELLIOTT, B.A. Occidental 1952 A critique of current theories of economic planning. 1956. *Harvard.*

LEMONT K. RICHARDSON, B.A. Wisconsin 1952; M.A. Cornell 1953. A history of the rural electric cooperatives in Wisconsin. 1956. *Wisconsin.*

National Income and Social Accounting

Degrees Conferred

JOHN W. KENDRICK, George Washington 1955. The meaning and measurement of national productivity.

EDWIN MANSFIELD, Duke 1954. City size and income, 1949.

T. HARRY MCKINNEY, Ph.D. Oklahoma 1955. Methods of estimating wages and salaries in the counties of Oklahoma.

HARLOW D. OSBORNE, Ph.D. Georgetown 1955. Economic foresight and gross national product models.

KEHAR SANGHA, Ph.D. Oklahoma 1955. An analysis of wages and value added by manufacture in Oklahoma.

Theses in Preparation

ROBERT A. BANDEEN, B.A. Western Ontario, 1952. State per capita incomes and automobile expenditures, 1940-1950 1955. *Duke.*

THOMAS J. FINN, B.A. Boston 1951; M.A. Harvard 1954. Factors influencing the level of national income in the United States, 1945-54. 1956. *Harvard.*

PAUL E. NELSON, B.B.A. Oklahoma 1951; M.B.A. 1952. The allocation of transfer payments in Oklahoma by county. 1956. *Oklahoma.*

FRANK PINET, B.S. Kansas 1942; M.B A 1947. Forms in which Kansans hold their wealth at time of death. 1955. *Kansas.*

WALTER A. SPIVEY, B.A. North Carolina 1950; M.A. 1952. Income payments in North Carolina counties, 1939-1950. 1955. *North Carolina*

Business Fluctuations; Prices

Degrees Conferred

VIRGINIA G. FLAGG, Ph D California 1955. Business fluctuations and the automobile industry.

EDWIN KUH, Ph.D. Harvard 1955. An econometric investigation of accelerator and profit theories of investment.

ELMER P. LOTSHAW, Ph.D. Iowa 1955 Inflation—an equilibrating process.

Theses in Preparation

JULIUS W. ALLEN, B.S. Iowa 1937; M.A American 1948. Economics of the Employment Act of 1946. 1956. *Johns Hopkins.*

THOMAS F. DERNBURG, B.A. Swarthmore 1952; M.A Yale 1953. The acceleration principle in business cycle theory 1956 *Yale.*

LYLE E. GRAMLEY, B.A Beloit 1951; M.A. Indiana 1952. Long-term investment opportunities and the major-minor cycle dichotomy. 1955. *Indiana.*

DOUGLAS G. HARTLE, B.A. Carleton 1950; M A Duke 1954 Employment forecasting, by industry, in Canada 1956. *Duke.*

EDWARD G. KOCH, B.S. New York 1937; M B A Michigan 1954. Business planning and economic policy: their significance in the 1953-54 recession. 1956. *Michigan.*

JAMES P. LOGAN, B.A. Princeton 1943; M.B.A Harvard 1949. The use of forecasts in business planning. 1957. *Columbia.*

ALVIN E. MULANAX, B.S. Kansas State 1946; M.S. 1951. A study of business failures and their relation to general business conditions. 1956. *Ohio State.*

DELMAR D. RAY, B.A. Western Kentucky State 1936; M.B.A. Chicago 1947. An evaluation of accounting: methodology as an accentuating factor in business fluctuation. 1956. *Florida.*

CHARLES D. SMITH, B.A. Swarthmore 1950. The countercyclical potential of state and fiscal action. 1956. *Cornell.*

HENRY THOMASSEN, B.Ed. Alberta 1951; B.Sci. 1953; M.A. Stetson 1954. The implications of business planning for economic stability in the United States. 1956. *Nebraska.*

Money and Banking; Short-Term Credit; Consumer Finance

Degrees Conferred

BERNARD J. BIENVENU, D.B.A. Harvard 1955. The function of the board of directors of smaller commercial banks.

ROBERT P. BLACK, Ph.D. Virginia 1955. An analysis of the impacts of the 1953 and 1954 reductions in Federal Reserve member bank reserve requirements.

HARRY BRANDT, Ph.D. Columbia 1955. U.S. monetary and credit policies between the end of World War II and the outbreak of the Korean war.

KOLLENPARAMPIL CHACKO CHACKO, Ph.D. New York 1955. The monetary and fiscal policy of India.

SHIH-CHEN CHEN, Ph.D. Illinois 1955. A proposed banking system for China with special reference to the system of the United States.

WILLIAM H. FICHTHORN, D.B.A. Harvard 1955. Retail store charge account services offered by commercial banks.

CHARLES F. HAYWOOD, Ph.D. California 1955. The implementation of monetary policy, with special attention to the availability of credit.

G. T. HUCHAPPA, Ph.D. New York 1955. The Reserve Bank of India and the money market.

JOHN J. KLEIN, Ph.D. Chicago 1955. German monetary development 1932-1944.

ROBERT P. LUMPKIN, Ph.D. Harvard 1955. Bank capital: problems and policies.

HERBERT H. MITCHELL, Ph.D. North Carolina 1954. The development of commercial banking in North Carolina, 1865-1935.

LEON M. SCHUR, Ph D. Wisconsin 1955. Central bank inflation control—American experience 1780-1929.

ARTHUR J. R. SMITH, Ph.D Harvard 1955. The growth of public and private debt in the United States, 1914-48.

AUBREY N. SNELLINGS, Ph D. Virginia 1955. The development of monetary policy in West Germany, 1948-1953.

LOUIS M. SPADARO, Ph.D. New York 1955. Salvation through credit reform: an examination of the doctrines of Proudhon, Solvay, and C. H. Douglas.

HAROLD L. SPAIN, Ph.D. California 1954. A history and appraisal of the real-balance doctrine.

THOMAS I. STORRS, Ph.D. Harvard 1955. An evaluation of credit control tools.

GEORGE M. TAOKA, Ph.D. Columbia 1955. The role of the Bank of Japan in the administration of the economic and financial controls of the government during national emergencies.

STOKES M. TOLBERT, Ph.D. Harvard 1955. Central banking and economic development: a case study of India.

CHARLES E. WALKER, Ph.D. Pennsylvania 1955 Federal Reserve policy and the government security market.

HAROLD WOLOZIN, Ph.D. Columbia 1955. The control of consumer credit from 1941 to 1949.

PETE ZIDNAK, Ph.D. Southern California 1955. Arizona's small loan problem.

Theses in Preparation

NICHOLAS BALABKINS, Dipl. rer. pol. Goettingen (Germany) 1949; M.A. Rutgers 1953. The currency reform of West Germany in 1948. 1956. *Rutgers.*

A. BALBACH, B.A. California (Los Angeles). Availability conditions of bank credit. 1958. *California (Los Angeles).*

MILTON F. BAUER, B.A. Western Ontario 1947; M.A. Toronto 1949. The credit union movement in the Province of Quebec. *Chicago.*

DON C. BRIDENSTINE, B.S. Oregon 1947; M.A. California (Los Angeles) 1954. A history of commercial banking in Arizona. 1956. *Southern California.*

CARROL W. EHLERS, B.S. Colorado 1942; M.S. 1949. Survey in the field of consumer credit in Indiana. 1956. *Indiana.*

O. ROGERS FLYNN, JR., B.S. Columbia 1921. A preliminary study of the relationship of capital strength and risk position of 208 large commercial banks in the United States at December 31, 1938; December 31, 1945; December 31, 1952. 1956. *Columbia.*

MATTHEW H. JONAS, B.A. California (Los Angeles) 1950; M.A. 1951. The nature, behavior and significance of savings (time) deposits. 1957. *California.*

JOSEPH A. KEHOE, C.S.C., B.A. Notre Dame 1933; M.A. 1941. Selected financial trends of commercial banks of Indiana, 1915-1954. 1956. *Catholic.*

ORLANDO H. LOBO, B.A. California 1951. Monetary measures and the capital market. 1957. *California.*

CHARLES F. MEEHLING, B.A. Brooklyn 1947. An analysis of federal credit unions in the United States. 1956. *New York.*

ALLAN H. MELTZER, B.A. Duke 1948. Monetary problems of French inflation 1939-54. 1958. *California (Los Angeles).*

BORIS P. PESEK, B.A. Coe 1952. Monetary policy of Czechoslovakia, 1945-1953. *Chicago.*

ROBERT W. STRAIN, M.B.A Louisiana State 1949; B.B.A. Texas Technological. Life with the Lincoln, a history of the Lincoln National Life Insurance Company, 1905-1955. 1955. *Indiana.*

GAMIL TEWFIK, B. Com. Alexandria 1948; M.A. Minnesota 1951. A study of Minnesota credit unions with consideration of adaptability of such institutions to underdeveloped countries, 1955. *Minnesota.*

THOMAS E. VAN DAHM, B.A. Hope 1948; M.A. Michigan 1949. Bank behavior and monetary policy. 1956. *Michigan.*

JOHN E. VAN TASSEL, B.A. Boston 1950; M.A. 1953. An analysis of American banking practices. 1956. *Harvard.*

NASSROLLAH VAQAR, Lic. in Law, Tehran 1943. An evaluation of the liquidity of the assets of commercial banks for selected years. 1955. *Kansas.*

MARK L. WEHLE, B.S. Harvard 1937. The level of long-term interest rates in relation to business cycles. 1956. *Columbia.*

Business Finance; Investments and Security Markets; Insurance

Degrees Conferred

KEITH L. BROMAN, Ph.D. Nebraska 1955. Some effects of non-contributory pension plans on the financial policy of corporations.

JACK W. CASHIN, Ph.D. Texas 1955. History of savings and loan associations in Texas.

ROBERT S. CLINE, Ph.D. Pennsylvania 1955. Valuation of life insurance assets.

JOHN R. DIER, Ph.D. New York 1955. The sale of securities through privileged subscriptions.

JESSE GLOSTER, Ph.D. Pittsburgh 1955. North Carolina Mutual Life Insurance Company.

MARK GREEN, Ph.D. Ohio State 1955. An analysis of credit insurance.

Roy J. Hensley, Ph.D. California 1955. An evaluation of economic performance of the property insurance industry.

Kenneth W. Herrick, Ph.D. Pennsylvania 1955. Total disability provisions in life insurance policies.

Harris Loewy, Ph.D. Wisconsin 1954. The flow of net cash savings through life insurance companies.

John L. O'Donnell, D.B.A. Indiana 1954. The financial operations of a regional investment bank.

Peter C. Peasley, Ph.D. Fordham 1955. The Investment Company Act of 1940; background, critical appraisal and recommendations for change.

Clayton J. Pilcher, Ph.D. Michigan 1955. Convertible bonds and preferred stocks; an analysis and evaluation of their role as capital raising instruments.

Max Richards, Ph.D. Illinois 1955. Intermediate credit and loan capital for small business.

Harold W. Snider, Ph D. Pennsylvania 1955. Investment in commercial real estate by life insurance companies.

Robert M. Stevenson, D.B.A. Indiana 1955. Major medical expense insurance.

Lester B. Strickler, D.B.A Indiana 1954. Financing of certain trucking companies from 1940 to 1952.

Joseph F. Trosper, D.B.A. Indiana 1954. A case study of the effect of group life insurance on the ownership of individual life insurance.

James Wert, Ph.D Ohio State 1954. Sources of equity capital for the small businessman

Theses in Preparation

Stephen H. Archer, B.A. Minnesota 1949; M.A 1953 Life insurance companies and the variable annuity. 1956 *Minnesota.*

Oliver D. Dickerson, B S Pennsylvania 1948; M B A 1951 Guaranteed renewable disability insurance. 1955. *Pennsylvania.*

Monroe Fischer, B.A. Duke 1937, M A 1938 The effect of insider activity upon common stock prices. 1956. *American.*

Walter T. Greaney, Jr., B.A. Boston College 1943; LL B. Boston University 1948; LL.M 1949; M.A. Harvard 1955. Effects of corporation income tax on corporate investment and operational policy. 1956 *Harvard.*

Richard J. Kruizenga, B.A Hope 1952. Price expectations in financial markets 1956 *Mass. Inst. of Technology.*

Howard C. Launstein, B.A Michigan State 1947; M.A. 1948. The development of financial statements for management of casualty insurers. 1955. *Ohio*

Jack H. Mathews, B.S. Kansas 1948; M B.A. Indiana 1953. Cash working capital requirements in regulated companies 1956 *Indiana*

Edward A. Nelson, B.S De Paul 1948; M.B.A. Chicago 1949. Analysis of the stock of life insurance companies as investments. 1956. *Missouri.*

Joseph Newhouse, B.S. West Virginia 1949; M.A 1951. The investment banking case: an economic and legal analysis. 1956 *Cornell.*

Melville Peterson, B S. Washington (St. Louis) 1943; M.S. 1948. A comparative study in debenture and mortgage bond financing 1955. *Illinois.*

Charles B. Saunders, B.S. Alabama 1942; M.A. 1949. Promotional methods now used by various financial instiutions to secure equitable capital. 1956. *Indiana.*

Jerome Zoffer, B.A. Pittsburgh 1952; M.A. 1953. History and methods of automobile liability insurance rate-making. 1956. *Pittsburgh.*

Public Finance

Degrees Conferred

ALEXANDER S. BALINKY, Ph.D. Harvard 1955. Albert Gallatin: Republican financier.

ALPHA CHUNG-I CHIANG, Ph.D. Columbia 1954. Income taxation in the federal state: a study of jurisdictional conflict.

JOHN M. FIRESTONE, Ph.D. Columbia 1955. Cyclical behavior of federal receipts and expenditures: 1879-1949.

GLENN W. FISHER, Ph.D. Wisconsin 1954. State individual income tax jurisdiction: a study of unneutral taxation.

JAMES E. HOWELL, Ph.D. Yale 1955. Federal fiscal policies and the regional economy: a study of distributive impact, 1950 and 1953.

ROBERT N. HOWELL, Ph.D. North Carolina 1954. A critical study of the application of the principle of the net income tax in North Carolina.

NORMAN H. JONES, JR., Ph.D. Iowa 1954. The regional redistribution effects of federal revenues and expenditures.

HAROLD Q. LANGENDERFER, D.B.A. Indiana 1954. The federal income tax: 1861-1872.

ROSALIE B. LEVINE, Ph.D. Wisconsin 1955. State-local fiscal relations: the New York and Wisconsin systems.

DAVID E. SHIRLEY, Ph.D. Southern California 1955. Economic and administrative aspects of capital budgeting in municipalities.

Theses in Preparation

LEWIS C. BELL, B.A. Berea 1953; M.A. Emory 1954. An analysis of third-structure taxes for highway use with special reference to their applicability to Kentucky. 1956. *Kentucky.*

DWIGHT S. BROTHERS, B.A. Colorado 1951; M.A. Princeton 1954. Capital consumption allowances as an object of public policy in the United States. 1956. *Princeton.*

DEANE C. CARSON. Treasury refinancing and monetary management: 1954-55. 1956. *Clark.*

LEO COHEN, B.S. California (Los Angeles) 1950; M.A. 1953. The federal budget as a tool for economic policy: a suggested framework. 1956. *California (Los Angeles).*

SEYMOUR FIEKOWSKY, B.A Wayne 1942; M.A. Harvard 1948. Economic effects of death taxes. 1955. *Harvard.*

JACK E. GELFAND, B A. Brooklyn 1943; M.A. 1948. The avoidance of personal income taxes in the United States. 1956 *New York.*

ROBERT K. KINSEY, B.A. Indiana 1949 An exploration into the possibilities of incorporating a national lottery into our tax system. 1957. *Columbia.*

MICHAEL E. LEVY, B.A. Hebrew 1952. The impact of secular inflation on the tax system. 1957. *Columbia*

HUGH H. MACAULAY, B.S. Alabama 1947; M S. 1948. Tax-favored income, the economy and public finance. 1956. *Columbia.*

WILLIAM J. MCKINSTRY, B.A. Michigan State 1943; M A Columbia 1947. Some aspects of the redistributive effects of the federal estate tax. 1956. *Yale.*

ALBERT M. MOORE, B A. Queens (Ontario) 1949 The tax treatment of the Canadian oil extraction industry. *Chicago.*

HECTOR J. RIVERA, B.A. Puerto Rico 1945; M.A New York 1949. Puerto Rican income tax. 1957. *New York.*

OLIVER L. ROBINSON, B.A. Wesleyan 1952; M.A. Yale 1953. Economic effects of tax depletion allowances. 1956. *Yale.*

CHING-SHENG SHEN, B.A. Yen-Ching (China) 1941; M.A. Boston 1951. State revenue forecasts. 1956. *North Carolina.*

JERRY P. SIMPSON, B.A. North Texas State 1950; M.A. 1951. Oklahoma's state indebtedness 1956. *Oklahoma.*

JOEL D. SINGER, B.A. Duke 1946. The fiscal process in the United Nations. 1956. *New York.*

WILBUR A. STEGER, B.S. Yale 1950; M.A. Harvard 1952. Averaging of income for income tax purposes. 1955. *Harvard.*

KERMIT WATKINS, B.A. William Jewell 1931; M.S. Colorado State 1932. Economic implications of state aid to local government in Kansas. 1955. *Kansas.*

WILLIAM J. WEISKOPF, B.A. New York 1942; M.P.A. 1947. An appraisal of the Ohio axle-mile truck tax. 1956. *New York.*

International Economics

Degrees Conferred

CHARLES S. BENSON, Ph.D. Columbia 1955. Short-term fluctuations in U.S. imports of apparel wool: a case study of a marginal import.

STERIE T. BEZA, Ph.D. Harvard 1955. Some aspects of productivity and the balance of payments.

FREDERICK A. BREIER, Ph.D. California 1955. The development of United States policies and attitudes toward western European exchange control.

MARCUS C. BRUHN, Ph.D. Wisconsin 1955. Sweden's balance of payments, 1920-1950.

EDWARD C. FEI, Ph.D. Washington 1955. A study of the balance of payments of Lebanon, 1951 and 1952.

WILLIAM C. FREUND, Ph.D. Columbia 1955. The concept and practice of equal treatment in U.S. commercial policy.

GEORGE GIBBS, Ph.D. California 1955. Economic significance of the reciprocal trade agreement program to California production and trade.

ASHER HALPERIN, Ph.D. Princeton 1955. Palestine's balance of international indebtedness 1930-1947.

FRANCES S. HARDIN, Ph.D. Colorado 1954. Economic and political effects of restrictions by the Department of Agriculture on United States foreign trade in agricultural commodities.

ABUL MAALI MOHAMMED MOAZZAMUL HUQ, Ph.D. Harvard 1955. The international aspects of U.S. demand for basic industrial raw materials.

GEORGE MASAO IWANAKA, Ph.D. Wisconsin 1955. Postwar German balance of payments

RAYMOND C. JANCAUSKAS, S.J., Catholic 1955. An evaluation of the International Monetary Fund.

HEINZ JAUCH, Ph.D. Columbia 1955. American foreign trade and domestic industrial organization.

ENRIQUE LERDAU, Ph.D. Wisconsin 1955. International trade and finance in New Zealand-1930 to 1945.

MICHAEL MICHAELY, Ph.D. Johns Hopkins 1955. Devaluation and dual markets under inflation with direct controls.

JOHN C. MURPHY, Ph.D. Chicago 1955. Long term contracts for the export of Denmark's butter and bacon.

ROBERT RABOLD, Ph.D. Pittsburgh 1955. Invisible items in international trade.

HANS F. SENNHOLZ, Ph.D. New York 1955. Inquiry into the problems of international cooperation and European unification.

MATTHEW SIMON, Ph.D. Columbia 1955. Cyclical fluctuations and the international capital movements of the United States, 1865-1897.

William F. Stanton, Jr., Ph.D. California 1955. The Food and Agricultural Organization of the United Nations and international food policy.

Robert W. Stone, Ph.D. Virginia 1955. Belgium in post-war intra-European trade and payments.

James A. Storer, Ph.D. Harvard 1955. Foreign trade policies of the Philippine Republic.

Roger W. Weiss, Ph.D. Chicago 1955. The British exchange controls 1939-1952: a study in discretion and discrimination.

David A. Wilson, Ph.D. California 1955. An analysis of lumber exports from the coast region of British Columbia to U.S. and United Kingdom 1920-1952.

Shu-Ch In Yang, Ph.D. Wisconsin 1954. Thailand's experience with multiple exchange rates.

Theses in Preparation

Edwin E. Boeventer, B.A. Goettingen 1952; M.A. Michigan 1954. The impact of the last three recessions on the American balance of payments. 1956. *Michigan.*

William Bryan, B.A. Wayne 1948; M.A. 1950. The economics of the Anglo-Iranian oil dispute. 1956. *Wisconsin.*

Fergus J. Chambers, B.A. Western Ontario 1952; M.Sc. London (England) 1954. Post-war Canadian commercial policy. 1957. *Toronto.*

Andre L. Daniere, Bacc. Math. Lyon 1943 Ingenieur Inst. Nat. Agronomique (Paris) 1948; M.S. Massachusetts 1950. Tests of efficiency for alternative patterns of development and trade. 1956. *Harvard.*

Maurice C. Ernst, B.A. Yale 1948 Italy in the post-war world economy. 1956 *Columbia.*

Thomas A. Goldman, B.A. Harvard 1939; M.A. George Washington 1952. International specialization and factor prices. *Chicago.*

John M. Gunn, Jr., B S Georgia Inst. of Tech 1949; M.A. Princeton 1954. A critical survey of the literature dealing with flexible rates of international exchange. 1955. *Princeton.*

Dukh Haran Nath Gurtoo, B A. Allahabad 1936; B Sc London, 1941. India's balance of payments. 1956. *Princeton.*

Gerald E. Harriman, B.S Notre Dame 1947; M.A South Dakota 1949. The economics of the transition between protectionism and free trade. 1956. *Cincinnati.*

Jacqueline L. Hodgson, B S Puget Sound 1951; M.A 1952. The trend of partial terms of trade of certain primary producing countries 1956. *Wisconsin.*

Arcadius Kahan, Dipl. in Law and Econ. Wilno (Poland) 1938; M.A. Rutgers 1954. A study of the price-elasticity of American demand for imported strategic raw materials. 1956. *Rutgers.*

Chi-Ling Lee, B.A. Nat. Central (China) 1944; M.A Wisconsin 1953. Flexible exchange rates and adjustment of payment. 1955. *Wisconsin*

Jonathan Levin, B.S Columbia 1950; M.A. Fletcher School Law and Diplomacy 1951 Systems of export taxation in export economics. 1956. *Fletcher School of Law and Diplomacy.*

Georg Marais, B. Com. Stellenbosch (S. Africa) 1951; M. Comm. 1953. Foreign trade of the Union of South Africa from 1926 to 1952 1956. *Wisconsin*

Mildred G. Massey, B.A. California 1942; M.A. Oregon 1951. The Italian international balance of payments, 1945-1954. 1956. *Oregon.*

Sarah S. Montgomery, B.A. Vassar 1951; M A Columbia 1952. The terms of trade of primary products and manufactured goods in world trade, 1870-1954. 1955. *Wisconsin.*

Jerome M. Pines, B.S. New York 1935; M.A. Columbia 1936. American economic policy toward Germany, 1945-1955. 1957. *Columbia.*

Emile E. Quevrin, LL.D. Louvain (France); Lic. Sc. Econ 1953 The terms of trade and economic development. 1956. *Princeton.*

GRANT L. REUBER, B.A. Western Ontario 1950; M.A. Harvard 1954. Changes in Anglo-Canadian trading patterns. 1955. *Harvard.*

ROBERT J. SCHWARTZ, B.S.S. City (New York) 1941; M.A. Columbia 1943. Obstacles to United States private foreign investment, 1947-1953. 1956. *American.*

JOSEPH F. TALARICO, B.A. Rutgers, 1949; M.A. 1951. Post-war commercial and financial relations between United States and Canada. 1955. *Rutgers.*

TEIMOOR M. VAZIRI, Lic. Econ. Tehran 1947; M.A. Indiana 1951. The economic relations of Iran and America since World War II. 1956. *New York.*

PAUL WELLS, B.A. Washington 1949. A general equilibrium analysis of trade, transfers and tariffs. 1955. *Stanford.*

RAYMOND E. ZELDER, B.A. Harvard 1950; M.A. Chicago 1951. The terms of trade, 1921-1938. *Chicago.*

Business Administration

Degrees Conferred

RICHARD BERGER, Ph.D. New York 1955. The marketing impact of 3-D.

HAROLD J. BIERMAN, Ph.D. Michigan 1955. The effect of inflation on depreciation and the computation of income of public utilities for the years 1940 to 1953.

PHILIP S. BORDEN, D.B.A. Harvard 1955. The marketing process in a large industrial organization.

SISTER ISADORE BROWN, O.S.U. Catholic 1955. The historical development of the use of ratios as applied to financial analysis.

REX V. CALL, Ph.D. Ohio State 1955. The wholesale distribution of meat products with special reference to Omaha, Nebraska as a meat packing center

KENNETH R. DAVIS, Ph.D. Chicago 1955. Marketing by wood household furniture manufacturers: a critical evaluation.

ALICE G. DORWORTH, Ph D. New York 1955. Shifts in the channels of distribution of selected consumer commodities.

DANIEL C. HAMILTON, Ph.D. Columbia 1954. The gulf coast refinery market from 1925 to 1950: a study in market behavior.

ARTHUR HIGHMAN, Ph.D. Chicago 1954. The self-administered questionnaire as a technique for measuring the market position of a brand: a critical appraisal.

CHARLES HORNGREN, Ph.D. Chicago 1955. Implications for accountants of the uses of financial statements by security analysts.

THOMAS ISAACK, D.B.A. Indiana 1955. Management problems of selected small machine tool firms during a national emergency.

LOUIS H. JORDAN, Ph.D. Columbia 1954. Financial accounting standards.

WALTER P. KENNON, Ph.D. Chicago 1954. The variables which affect costs and how economists and managers evaluate the effect of these variables in the determination of production functions and standard costs.

MAYBELLE KOHL, Ph.D. Columbia 1954 The role of accounting in pricing.

HARRY A. LIPSON, Ph D. Pennsylvania 1955. The development of multiple-unit large department store investment-management systems 1920-1953; selected case studies.

KULLERVO LOUHI, Ph.D. Chicago 1955. Financial accounting and managerial accounting: some points of contrast.

MILTON P. MATTHEWS, Ph.D. New York 1955. An analysis of drug retailing in Utah.

WILLIAM C. MCINNES, S. J., Ph.D. New York 1955. A general theory of marketing.

ADRIAN F. MURPH, Ph.D. Texas 1955. A study of differential costs as a basis for managerial decisions.

WINSTON OBERG, Ph.D. Mass. Inst. of Technology 1955. Management development: research into three problem areas.

HAROLD E. PADDOCK, Ph.D. Texas 1955. Production waste—its nature and its accounting.

COLIN I. PARK, Ph.D. Chicago 1955. Accounting period theory and analysis.

HARRY V. ROBERTS, Ph.D. Chicago 1955. The role of research in marketing management.

BROADUS E. SAWYER, Ph.D. New York 1955. Influence on accounting by concepts in allied fields.

JAMES S. SCHINDLER, Ph.D. Michigan 1955. Quasi-reorganization and other major accounting adjustments.

WILLIAM E. SCHLENDER, Ph.D. Ohio State 1955. An investigation of certain basic management problems under annual guarantees of employment and wages.

FRANK A. SINGER, D.B.A. Indiana 1955. A summary and evaluation of selected terms of variable usage in financial accounting.

JOHN D. STANLEY, D.B.A. Indiana 1954. An organization and appraisal of published research management problems of informal organizations as it relates to management practice.

WAINO W. SUOJANEN, Ph.D. California 1955. The management factor in the large organization.

RALPH D. SWICK, D.B.A. Indiana 1954. An analysis of cost accounting methods in the Indiana tomato canning industry with proposals for uniformity.

DONALD A. TAYLOR, Ph.D. Michigan 1955. The economic and social significance of certification marks.

AITCHESON B. VAN DER VOORT, Ph.D Georgetown 1955. Replacement cost depreciation of producers' durable equipment and estimate and analysis thereof.

Theses in Preparation

JOSEPH W. BACHMAN, B.S. Colorado 1948; M.S. Illinois 1953. Responsibility of financial management relating to capital impairment under changing price levels. 1956. *Illinois.*

ALAN CERF, B.S. California 1944; M.B.A Harvard 1947. Economic implications of inventory valuation methods. 1955 *Stanford*

JOHN W. COUGHLAN, B.A Alberta 1948; B. Com 1949; M.A. Western Ontario 1952. Accounting and changing prices 1955. *Johns Hopkins.*

DENNIS M. CRITES, B.S. Oklahoma 1947; M.B.A. 1949. Study of the wholesaling market of Oklahoma and surrounding states. 1956 *Indiana*

GEORGE A. ELGASS, B.B.A. Michigan 1948; M.B.A. 1948. The multi-line firm in relation to competition. 1956. *Michigan.*

ROBERT D. ENTENBERG, B.S. Washington (St Louis) 1951; M.B.A. 1952. Changing relative position of department stores in United States by merchandise lines. 1956. *Ohio State.*

BENNETT FINLER, B.A. City (New York) 1933. Depletion in theory and practice. 1956. *American.*

GUY G. GORDON, B.A. Washington 1949; M.B.A 1950. The wholesaling potential of a satellite city. 1956. *California*

JAMES G. HAUK, B.S. Indiana 1948; M.B.A. 1949. Economic and managerial aspects of product service. 1957. *Michigan.*

RICHARD M. HILL, B.A. Columbia 1948; M.A. 1949. The regularization of retail inventory investment by department stores and departmentalized specialty stores. 1956. *Columbia.*

PAUL HOFFMAN, B.A. New Jersey State Teachers 1938; M.A. Michigan 1943; M.B.A. New York 1948. Manufacturers' brands. 1957. *New York.*

BEN INGERSOLL, B.A. Morehouse 1937; M.A. Atlanta 1938. Some American contributions to accounting thought. 1957. *Catholic.*

RICHARD E. LUNDQUIST, B.B.A. Minnesota 1945; M.A. Northwestern 1948. Quasi-reorganization. 1955. *Minnesota.*

CLAUDE MCMILLAN, B.S. Colorado 1950; M.S. 1953. Management uses of financial standards at base level in the United States Air Force. 1956. *Ohio State.*

HOWARD E. MORGAN, B.S. Wisconsin 1941; M.B.A. California 1952. An analysis of employment income, and retail sales in selected county areas. 1957. *California.*

HENRY D. OSTBERG, LL.B. New York Law; M.B.A. Ohio State 1952. Functional discounts: legal and economic implications. 1956. *Ohio State.*

GARLAND C. OWENS, B.S. Richmond 1947; M.S. Columbia 1948. Concepts of cost in changes of ownership. 1956. *Columbia.*

JOHN RIVOIRE, B.S. Cornell 1942; M.B.A. 1948. Penicillin and other antibiotics 1943-1953—an economic analysis of market behavior in a segment of American manufacturing industry. 1956. *Fordham.*

KARL W. SCHLUBACH, B.A. Kentucky 1935; M.B.A. Harvard 1936. DuPont as a growth corporation. 1957. *New York.*

ROBERT T. SPROUSE, B.A. San Diego State 1951; M.B.A. Minnesota 1952. The effect of the concept of the corporation on accounting. 1956. *Minnesota.*

REED K. STOREY, B.S. Utah, 1952. Matching revenues with costs: a reconsideration of the accounting convention of income realization. 1957. *California.*

WELDON J. TAYLOR, B.S. Brigham Young 1934; B.A. Harvard 1937. A citical analysis of a standard for creating scientific objectives in the study of marketing and the application of such standard to contemporary marketing literature 1955. *New York.*

HOWARD L. TIMMS, B.S. Purdue 1940; M.B.A. Indiana 1953. A philosophy concerning the interrelated nature of business factors in the individual firm 1955. *Indiana.*

WILLIAM J. WATKINS, B.B.A. Michigan 1948, M B.A. 1948 Marketing research as applied to retailing. 1957. *Michigan.*

RICHARDS S WOODS, B.A. Rochester 1941; M.B.A Pennsylvania 1947. Accounting problems in the field of marketing. 1957 *Pennsylvania.*

RAYMOND J. ZIEGLER, B B.A. Toledo 1946; M B A 1948. Management control 1955 *Florida.*

Industrial Organization; Public Regulation of Business

Degrees Conferred

THOMAS V V. ATWATER, JR., Ph.D Harvard 1955 Discrimination, competition, and the structure of heterogeneous markets.

EPPES W. BROWNE, JR., Ph D Harvard 1955 A national rubber policy.

ALBERT DUDENHOEFFER, S.J., Ph.D. St. Louis 1955. The multiple basing point system of delivered price in the Portland cement industry.

OTTO ECKSTEIN, Ph.D. Harvard 1955. Benefits and costs: studies in the economics of public works evaluation.

RONALD S. JOHNSON, Ph.D. Michigan 1955. The marginal approach to public construction of a lakeside levee.

MAURICE C. MACKEY, JR., Ph D. Illinois 1955. Government stimulation of private investment.

DAVID D. MARTIN, Ph.D. California (Los Angeles) 1955. Section 7 of the Clayton Act in relation to the past and future of corporate mergers.

JOHN PARKANY, Ph.D. Columbia 1955. Federal Trade Commission enforcement of Robinson-Patman Act, 1946-1952.

Theses in Preparation

WILLIAM L. BALDWIN, B.A. Duke 1951; M.A. Princeton 1953. Anti-trust enforcement and the financial problems of large firms. 1956. *Princeton.*

LEONARD M. BERKE, B.A. Brooklyn 1940; M.A. George Washington 1948. An appraisal of the effectiveness of the Sherman Act in devestiture of economic control. 1958. *American.*

JAMES G. BLACK, Economics of stockpiling strategic and critical materials. 1955. *Georgetown.*

GILBERT T. BROWN, B.A. Yale 1949; M.A. 1951. The entry of new firms into manufacturing in Connecticut since World War II. 1956. *Yale.*

JOHN S. DYDO, B.A. Columbia 1947; B.S. California 1951. Inter-industry mergers, 1946-1954. 1956. *California.*

BROTHER JOHN GLENNON, B.A. Fordham 1940; M.A. 1949. Cooperative elimination of unfair methods of competition—the trade practice conference procedure of the Federal Trade Commission. 1956. *Fordham.*

BERNARD A. KEMP, B.S. North Carolina 1948. The merger component in the growth of a firm. 1955. *Vanderbilt.*

BOB KITTLESON, B.A. Washington State 1949; M.A. 1950. Certain competitive aspects of the fractional horsepower motor industry. 1956. *Northwestern.*

STEWART M. LEE, B.A. Geneva 1949; M.A. Pittsburgh 1950. Some influences of fair trade practices on certain economic institutions. 1956. *Pittsburgh.*

MOHAMED SAMI MOHAMED, B. of Comm., High Inst. of Finance and Commerce, Cairo (Egypt) 1947; M.B.A. Denver, 1949. Federal regulation of business by the Federal Trade Commission. 1957. *New York.*

HOWARD SCHULTZ, B.S. Xavier 1949; M.A. Cincinnati 1950. Government control in the meat industry. 1956. *Pittsburgh.*

LEWIS E. WAGNER, B.S.C. Iowa 1950; M.A. 1951. An analysis of recent contributions to the theory of industrial organization and market behavior. 1956. *Iowa.*

Public Utilities; Transportation; Communications

Degrees Conferred

JAMES W. BENNETT, JR., Ph.D. Florida 1955. The Railway Labor Act of 1926.

RALPH K. DAVIDSON, Ph.D. Johns Hopkins 1955. Price discrimination in selling gas and electricity.

HERMAN A. ELLIS, D.B.A Indiana 1954. Southeastern Greyhound Lines—a history of the management and financial policies of a Class 1 intercity motor bus company.

PAUL J. GARFIELD, Ph.D. Wisconsin 1955. Recent developments in Wisconsin public utility regulation.

GILBERT L. GIFFORD, Ph.D. Pennsylvania 1955. The economic aspects of national aviation policy.

CLARENCE H. GILLETT, Ph.D. Chicago 1955. Development of the transcontinental freight rate structure.

ARTHUR L. GREY, JR., Ph.D. California 1954. Financial aspects of the development of urban passenger transportation with special reference to San Francisco, California.

JOHN P. HARDT, Ph.D. Columbia 1955. Economics of Soviet electric power industry.

HUBERT W. HARRIES, Ph.D. Iowa (Ames) 1954. Canadian freight rate control by statute

JANE KENNEDY, Ph.D. Columbia 1955. U.S. postal rates 1845-1951.

GILBERT MELLIN, Ph.D. Pittsburgh 1955. The Mississippi Shipping Company.

WALTER POLNER, Ph.D. Wisconsin 1954. The development of the railroad system through 1937.

RICHARD W. REED, Ph.D. Clark 1955. Toll roads in the state highway system.

Charles E. Stonier, Ph.D. Pennsylvania 1955. The Long Island Railroad—a case study in the problems of public transit.

Virginia G. Tauchar, Ph.D. California 1955. Investment in the electric power industry.

William Weiner, Ph.D. Columbia 1955. A study of the Hope Natural Gas Company—its historical background and economic significance.

Charles Williams, Ph.D. Pittsburgh 1954. The Pennsylvania Turnpike.

George W. Wilson, Ph.D. Cornell 1955. Transportation and value theory.

Joseph V. Yance, Ph.D. Harvard 1955. Investment behavior in the railroad industry.

Theses in Preparation

Isaiah Bard, B.A. Yeshiva 1940; M.A. New York 1952. Section 315 of the Communications Act and the presidential elections of 1952. An inquiry into problems raised by the provisions of Section 315 of the Communications Act of 1934 as evidenced in the use of broadcast facilities during the presidential elections of 1952. *New York.*

Richard K. Darr, B.A. Midland 1948; M.A. Nebraska 1952. History of the Nashua and Lowell Railroad. 1955. *Nebraska.*

Robert G. Dederick, B.A. Harvard 1951; M.A. 1953. The economics of Boston's Metropolitan Transit Authority. 1956 *Harvard.*

Eugene A. DuBois, B.A. St. Johns 1949. The Muscle Shoals controversy. 1956. *New York.*

Donald V. Harper, B.S. Illinois 1950. State regulation of motor carriers. 1956. *Illinois.*

Joseph R. Hartley, B.S. Ball State Teachers, 1953; M.B.A. Indiana 1954. The impact of the St. Lawrence Seaway on the mid-west grain markets. 1956. *Indiana.*

John E. McGrath, B Ph. Chicago 1949; M B A. 1950. Piggyback: transportation of trailers on flat cars. 1955. *Indiana.*

James M. Patterson, B.S. U.S. Merchant Marine Acad. 1948; M.B.A. Cornell 1954. The subsidy problem in United States transportation. 1957. *Cornell.*

George B. Tully, B.S. Pittsburgh 1942; M.B.A. California 1949. Public utility rate regulation under competitive conditions. 1957. *Wisconsin.*

Walter Zukowshi, M.A. Clark 1949. The Panama Canal. 1956. *Clark*

Industry Studies

Degrees Conferred

Harry L. Barrett, Jr., Ph.D. Harvard 1955. Price and output policy in the gypsum industry.

Alva M. Clutts, Ph.D. Texas 1955. A statistical study of the building industry in Texas.

Hiram S. Davis, Ph.D. Pennsylvania 1955. A cross section analysis of variations of capital output in manufacturing—an illustrative study of seven contrasting industries.

Johannes H. deLoor, Ph D. Columbia 1955. A comparative study of American and South African experience in the manufacturing and selling of Portland cement.

John C. Eddison, Ph.D. Mass. Inst. of Technology 1955. A case study in industrial development—the growth of the pulp and paper industry in India.

Victor R. Fuchs, Ph.D. Columbia 1955. The economics of the fur industry: a study of a highly competitive industry in a less competitive economy.

George S. Gibb, D.B.A. Harvard 1955. Saco-Lowell shops.

Walter S. Measday, Ph.D. Mass. Inst. of Technology 1955. The American jeweled watch industry.

Kesav P. Pillai, Ph.D. New York 1955. The economics of costs and prices in iron and steel industry in the United States and India.

Robert Rosen, Pittsburgh 1955. Management dynamics in the woolen-worsted industry.

Abdus Sattar, Ph.D. Texas 1955. Fiber properties and production of world cottons and their values in merchandising cotton.

Irwin M. Stelzer, Ph.D. Cornell 1954. The cotton textile industry.

Andrew H. Trice, Ph.D. California 1955. California manufacturing branches of national firms, 1899 to 1948.

Theses in Preparation

Bruce Cheek, B.A. Adelaide (Australia) 1947; M.A. 1949. Industry study of the boot and shoe industry in the United States. *Harvard.*

John L. Enos, B.S. Mass. Inst. Tech. 1949; M.A. Western Reserve 1952. The history of cracking in the petroleum refining industry. 1955. *Mass. Inst. Tech.*

Edwin Libbin, B.A. Texas 1947; M.B.A. Pennsylvania 1948. Economics of the paper industry in Brazil. 1957. *Pennsylvania.*

James L. McCarthy, B.S. Massachusetts 1943; M.A. Connecticut 1947. The American copper industry, 1918-1953. 1956. *Yale.*

Thomas A. Petit, B.A. California 1949; M.B.A. Stanford 1951. The economics of the Douglas fir plywood industry. 1955. *California.*

Miguel A. Reguero, B.A. New York 1947. A survey of the military airframe industry. 1956. *New York.*

Hubert E. Risser, Colorado School of Mines 1937 An analysis of the changing structure of the bituminous coal industry. 1956. *Kansas.*

Tsung-yuen Shen, B.A. Ohio Wesleyan 1952; M A Yale 1953. Technology and costs in the cotton textile industry. 1956. *Yale.*

Sidney Sonenblum, B.A. New York 1948; M.A. Columbia 1951. The role of innovation in the copper industry. 1956. *Columbia.*

Henry B. Steele, B.A. Rice Inst. 1953. The economic potentiality of synthetic liquid fuel from oil shales. 1956. *Mass. Inst. of Tech.*

Louis H. Stern, B.S. Illinois 1947; M.A. California (Los Angeles) 1954. The southern California dinnerware industry. A study in location of industry and international trade theory. 1957. *California. (Los Angeles).*

Land Economics; Agricultural Economics; Economic Geography

Degrees Conferred

James N. Boles, Ph.D. California 1955. Economics of scale for evaporated milk plants in California.

Arthur C. Bowman, Ph.D. Texas 1955. The history and present status of water utilization on the Rio Grande.

Theodore C. Boyden, Ph.D. Harvard 1955. The location of petroleum refining in the United States, 1859-1900.

James O. Bray, Ph.D. Chicago 1955. Agricultural land in a developing economy.

William Cassidy, Ph.D. Pittsburgh 1955. The tri-state non-ferrous mining industry.

Reynold P. Dahl, Ph.D. Minnesota 1954. An economic analysis of the agricultural production lending activities of Minnesota country banks.

William L. Dorries, Ph.D. Texas A. & M. 1955. An appraisal of the Texas Veterans' Land Program.

William M. Drummond, Ph.D. Harvard 1955. Agriculture in Newfoundland.

Irving Dubov, Ph.D. California 1955. The evaporated milk industry in the western region.

Allie C. Felder, Jr., Ph.D. Ohio State 1954. The acceptance of recommended peanut production and marketing practices in Nansemond County, Virginia relative to family organization, family values and relative social and economic status factors.

Darrell F. Fienup, Ph.D. Wisconsin 1955. Price aspects of milk procurement under conditions of imperfect competition.

John L. Fischer, Ph.D. Wisconsin 1955. The economics of co-operative purchasing of farm supplies in Tennessee, with emphasis on the financial aspects.

William A. Frank, Ph.D. Chicago 1955. Costs and returns to farmers from reducing seasonal variability of hog supplies.

Bernard H. Friedman, Ph.D. Pittsburgh 1955. Economic aspects of conservation of natural resources with special reference to soil, water and forests.

Elsayed Gaballah, Ph.D. Wisconsin 1954. The forward price approach to agricultural stabilization.

Karl Gertel, Ph.D. Iowa (Ames) 1954. Economic aspects of irrigation in the western cornbelt fringe with special reference to the proposed Sargent Reclamation Project in central Nebraska.

James C. Gilson, Ph.D. Iowa (Ames) 1954. Optimum livestock production under varying resource and price-cost situations in northeast Iowa—an application of linear programming.

Roland J. Hildreth, Ph.D. Iowa (Ames) 1954. Farmers' investment decisions in relation to time and uncertainty.

Eugene J. Kelley, Ph.D New York 1955. Location of controlled regional shopping centers.

Masuda Khan, Ph.D. Minnesota 1954 An evaluation of Minnesota farm price index numbers and recommendations for the future.

Ragner L. Kristjanson, Ph D. Wisconsin 1955 Nonprice factors in milk procurement.

Charles E Lee, Ph D Minnesota 1954. Economic effects of sanitary regulations relating to milk markets.

John R. Lindsay, Ph D Harvard 1955 The location of oil refining in the United States

Travis W. Manning, Ph.D. Minnesota 1954. An analysis of the economic efficiency of Minnesota dairy cooperatives.

Joe A. Martin, Ph.D. Minnesota 1955. The impact of industrialization upon agriculture

Glynn McBride, Ph.D. Wisconsin 1955. International trade policies and programs with special reference to the dairy industry.

Arthur H. Miller, Ph D. Wisconsin 1955. Bulk assembling of Wisconsin milk, farm to plant.

Frederick W. Morrissey, Ph D. California 1955 Price control in the fluid milk industry 1950-1952.

John C. Murdock, Ph.D. Wisconsin 1955. Conservation and the economic theory of depletion of exhausting nonrenewable resources.

Richard R. Newberg, Ph.D. Minnesota 1954. An analysis of changes in hog-cattle price relationships, 1900-1953.

Loris A. Parcher, Ph.D. Texas A. & M. 1955. The use and tenure of land in Oklahoma held primarily for its mineral potential.

Arthur Pynnonen, Ph.D. Wisconsin 1955 Low income in agriculture: a resource use and adjustment problem.

Job K. Savage, Jr., Ph.D. Wisconsin 1955. The effect of non-member patron business on farmer cooperatives.

Albert H. Schaaf, Ph.D. California 1955. An economic analysis of the United States government's mortgage interest rate policy.

Eugene W. Schooler, Ph.D. Harvard 1955. Regional advantage in the production of chemicals from petroleum and natural gas.

EDGAR T. SHAUDYS, Ph.D. Ohio State 1954. A critical analysis of Ohio dairy production cost studies with special emphasis on the farm approach.

HENRY K. SHEARER, Ph.D. Pennsylvania 1955. The economic effects of the original section of the Pennsylvania Turnpike on adjacent areas.

GORDON R. SITTON, Ph.D. Stanford 1954. California rice farming: a case study in the theory of the firm.

ROBERT G. F. SPITZE, Ph.D. Wisconsin 1954. An analysis of the act as an economic phenomena: the concept of economic power and the problems of agriculture.

THOMAS H. STRONG, D.P.A. Harvard 1955. Agriculture in relation to balanced economic development in Australia.

JAY P. SWANSON, Ph.D. Minnesota 1955. The economic effects of varying amounts of forage on the organization of Minnesota farms.

JOHN W. THOMAS, Ph.D. Iowa (Ames) 1954 Timing of conservation returns.

GEORGE S. TOLLEY, Ph.D. Chicago 1955. Earnings of labor and capital in the food processing industries.

DALE H. WEEKS, Ph.D. Nebraska 1955. Some economic aspects of electrical power and the Missouri River Basin development.

EGON P. WINTER, Ph.D. Wisconsin 1955. The effects of the relocation of a cross-country highway on land values, land transfers and land uses.

ALVIN B. WOOTEN, Ph.D. Texas A. & M 1955 An economic analysis and appraisal of the wool marketing system in Texas.

Theses in Preparation

STANLEY W. ACKLEY, B.A. Rutgers 1948, M.A 1950 Industrial trends in the Tennessee Valley region. 1955. *Rutgers*.

CHARLES H. BERRY, B S Ag, McGill 1951; M.S Connecticut 1953 Farm employment 1940-1950—a cross-sectional analysis *Chicago*

CHARLES F. BORTFELD, B S Nebraska 1937; M A 1939 Recommended shifts in the uses of farm resources in response to certain changes in price relationships of selected farm products in south central Kansas. 1956 *Minnesota*

ROBERT C. BROWN, B.S. California 1949; M.P.A Harvard 1952. Local land use planning with particular reference to Butte County, California *Harvard*

GERALD A. CARROTHERS, B. Arch Manitoba 1948; M. Arch 1951; M C P Harvard 1953. Techniques of projecting population for urban and regional analysis 1956 *Mass. Inst. of Tech*.

WILLIAM E. CHRISTIAN, JR, B.S Mississippi State 1942; M S. Iowa (Ames) 1947. Impact of industrialization upon the marketing outlets for locally produced farm products *Chicago*.

GEORGE S. DUGGAR, B A. Wisconsin 1936; M.A 1937; M.A Harvard 1944. The tax structure in a responsible program for housing. 1955. *Harvard*.

DONN K. HAGLUND, B.A. Drake 1948; M A. Pennsylvania 1950 The economic geography of the Godthaab, Greenland district 1957 *Pennsylvania*

JOHN J. HUGHES, JR., B.A. Boston 1948; M A Brown 1951 Determinants of the volume of residential construction. 1957 *Brown*.

RAY S. KELLY, B.A. Williams 1948; M.A Johns Hopkins 1950 The natural resources of New England. 1955. *Vanderbilt*.

DONALD S. MOORE, B.S. Oklahoma A. and M. 1938; M.S. 1940. Economic and managerial factors affecting changes in size and organization of a group of southeastern Minnesota farms 1930-1954. 1956. *Minnesota*.

YAIR MUNDLAK, B.S. California 1953. An appraisal of methods of early season crop yield estimates. 1956. *California*.

ROBERT C. OTTE, B.S.A. Nebraska 1947; M.A. 1954. An appraisal of watershed programs in Wisconsin. 1956. *Wisconsin*.

JOHN H. PORTER, B.A. Manchester 1941; M.C.S. Indiana 1947. An economic history of central Indiana from 1790-1820 with special reference to land value. 1956. *Indiana*.

GLEN C. PULVER, B.S. Wisconsin 1951. The economics of livestock production in Wisconsin. 1956. *Wisconsin*.

JAMES RICE, B.S. Pennsylvania 1928; M.L. Pittsburgh 1941. Taxation of mineral deposits. 1956. *Pittsburgh*.

MYRON H. ROSS, M.A. Temple 1947. Economics of parking in center city Philadelphia 1949-1954. 1956. *Pennsylvania*.

ROBERT B. SCHWART, B.S. Ohio State 1947; M.S. 1949. Decision making in corn belt states as related to various knowledge situation. 1956. *Ohio State*.

RAYMOND E. SELTZER, B.S. Illinois 1940; M.S. Kansas State 1942. An analysis of the competitive position of the Los Angeles cattle market. 1956. *California*.

MILES H. SONSTEGAARD, B.S.C. South Dakota 1950; M.S. Denver 1951. The economics of cottonseed products: with special reference to industrial development in Arkansas. 1956. *Oregon*.

GORDON L. SPANGLER, B.A. Tufts 1950; M.A. Fletcher School Law and Diplomacy 1951. Conflicts in U. S. agricultural and trade policies 1933-1955. 1956. *Fletcher School Law and Diplomacy*.

WILLIAM P. STEPHENS, B.S. Tennessee 1948; M.S. 1949. Farm organizations for new irrigation areas in eastern New Mexico. 1956. *Minnesota*.

KYUNHI TCHAH, B. Agr. Tokyo Agr. 1943. Farm labor mobility in Wisconsin. 1956. *Wisconsin*.

LESTER G. TELSER, B.A. Roosevelt 1951. Storage, hedging and the Commodity Credit Corporation. *Chicago*.

WAYNE H. WERNIMONT, B.A. Nebraska 1940. Economic problems related to the Missouri Basin development program. 1956. *American*.

JOHN M. WETMORE, B.A. Kansas 1948; M.A. 1950 The economic effects of the Commodity Credit Corporation on grain marketing. 1956. *Harvard*.

JOSEPH W. WILLETT, B.S. Xavier (Ohio) 1942; B.S. Ag. Kentucky 1950; M.S. Ag 1951 White and non-white commercial farm operators in the southern states. *Chicago*.

Labor

Degrees Conferred

JOHN W. BALLENTINE, Ph.D. Harvard 1955. Principles of decision-making under collective bargaining.

JOHN M. BROWN, Ph.D. New York 1955. A wage payment plan utilizing statistical principles to provide an incentive for improving the quality of production.

GERHARD BRY, Ph D Columbia 1955. Wages in Germany, 1871-1945.

EARL F. CHEIT, Ph.D. Minnesota 1955. A study of some possible incentive effects of workmen's compensation benefits.

A.D. JOSEPH EMERZIAN, Ph.D. New York 1955. A study of the arbitration activities of the Connecticut State Board of Mediation and Arbitration.

HARRY B. ERNST, Ph.D. Harvard 1955. Some applications of industrial production functions.

MERTON W. ERTELL, Ph.D. Chicago 1955. The C.I.O. Industry Council Plan—its background and implications.

CYRIL L. FRANCIS, Ph.D. Wisconsin 1955. Government seizures in labor disputes.

WALTER H. FRANKE, JR., Ph.D. Wisconsin 1955. Employment opportunities of older people.

PAUL V. GRAMBSCH, D.B.A. Indiana 1955. The impact of the Wage Stabilization Board upon management practices and procedures.

H. MURRAY HERLIHY, Ph.D. Chicago 1954. The determinants of the collective bargaining policies of the UAW-CIO in Canada.

DAVID B. JOHNSON, Ph.D. Wisconsin 1955. Labor management relations in the atomic program.

MARK W. LEISERSON, Ph.D. Harvard 1955. Wages in a controlled economy: an analysis of Norwegian wage policy, 1945-53.

ROBERT M. MACDONALD, Ph.D. Yale 1955. Unionism and the wage structure in the United States pulp and paper industry.

JOHN E. MAHER, Ph.D. Harvard 1955. Union, nonunion wage rate differentials.

THOMAS J. MCDERMOTT, Ph.D. Boston 1955. The effectiveness of investigation in the settlement of labor disputes.

JULIUS J. MANSON, Ph.D. Columbia 1955. Problems and standards in labor arbitration: a study of New York state experience.

FREDDIE R. MARSHALL, Ph.D. California 1954. History of labor organization in the south.

MORRIS D. MORRIS, Ph.D. California 1954. A history of the creation of a disciplined labor force in the cotton textile industry of Bombay City, 1851-1951.

JAMES H. MULLEN, Ph.D. Pennsylvania 1955. A study of supervisory attitudes in selected labor markets.

GRADY L. MULLENNIX, Ph.D. Texas 1955. A history of the Texas State Federation of Labor.

OSCAR A. ORNATI, Ph.D. Harvard 1955. Strategies in collective bargaining negotiations.

SHREEKAND ANANDRAO PAIEKAR, Ph.D. Harvard 1955. An analysis of real wages in India, 1939-50.

MURRAY E. POLAKOFF, Ph.D. Columbia 1955 The development of the Texas State C.I.O. Council.

ARTHUR R. PORTER, JR., Ph.D. Pennsylvania 1955 Practice of the International Typographical Union.

JOSEPH A. RAFFAELE, Ph.D. Pennsylvania 1955. The structure of clerical wages; an analysis of the structure and changes in office clerical rates in the Philadelphia labor market, 1939 to 1953.

ROBERT K. READY, D B A. Harvard 1955 The emergence of leadership in manufacturing work groups.

JANE C RECORD, Ph.D. California 1954. Ideologies and union leadership: the case of Harry Bridges and Harry Lundeberg.

MURRAY M. ROHMAN, Ph D. Colorado 1954. The influence of wage stabilization boards on collective bargaining in the steel industry.

ROBERT J. ROSE, Ph.D. Wisconsin 1955. Some effects of seniority in industry.

EDWARD ROSENBAUM, Ph.D Wisconsin 1954 The expulsion of the International Longshoremen's Association from the American Federation of Labor.

MELVIN ROTHBAUM, Ph.D. Harvard 1955. An interpretation of wage structure changes in France, Italy and the United States from 1938-1952.

EGIL SCHONNING, Ph.D. Toronto 1955. Union-management relations in the pulp and paper industry of Ontario and Quebec.

THERESA A. R. SHAPIRO, Ph D. Columbia 1955. Occupational mobility and labor supply in the sciences.

ABRAHAM SHUCHMAN, Ph.D. Pennsylvania 1955. Co-determination in Germany.

FRANK L. SIMONETTI, D.B.A. Indiana 1954. Worker restriction of output under collective bargaining in the Ohio rubber industry.

JOHN H. D. SPENCER, Ph.D. North Carolina 1954. A study of the male, manual manufacturing labor force of El Paso, Texas, 1952.

KARL H. STEIN, Ph.D. New York 1955. Labor codetermination in the Federal Republic of Germany.

JAMES L. STERN, Ph.D. California 1954. The role of the local union: case study of Local 844, UAW-CIO.

(HALSTEN) JOHN THORKELSON, Ph.D. Wisconsin 1955. Union education programs, 1941-1953.

LUDWIG A. WAGNER, Ph.D. Columbia 1955. The wage policy of the Swedish trade unions under full employment and full utilization.

ROBERT E. WEINTRAUB, Ph.D. Chicago 1954. Earning rates of workers from agricultural areas and labor recruited elsewhere in a southern industrial plant.

SAMUEL M. WILSON, Ph.D. Pennsylvania 1955. The development of work measurement systems in the department of defense.

Theses in Preparation

GWENDOLYN J. BYMERS, B.S. North Dakota 1948; M.A. California (Los Angeles) 1950. The labor market and seasonal employment problem—women's garment industry in southern California. 1956. *California (Los Angeles).*

SHERRILL CLELAND, B.A. Oberlin 1949; M.A. Princeton 1951. The influence of plant size on industrial relations. 1955. *Princeton.*

JAMES F. CRAWFORD, B.A. Peru State 1941; M.A. Colorado 1952. Pattern bargaining in the meat-packing industry. 1955. *Wisconsin.*

DEMETRIOS DERTOUZOS, B.A. Rutgers 1948; M.A. Wisconsin 1949 The Greek trade union movement 1944-1952. 1956 *Rutgers.*

MARY L. DOOLEY, B.A. Wisconsin 1947; M.A. 1953. The role of government in collective bargaining. 1956. *Wisconsin.*

FREDERICK T. DOWNS, B.A. Wisconsin 1947. Impact of rapid growth on a rural labor movement. 1955. *Wisconsin.*

TERESA FELLER, B.S. Cornell 1951; M.S. Columbia 1952. The American Federation of Labor and unemployment. 1957. *Columbia.*

LLOYD L. GALLARDO, B.A. St. Mary's (California) 1941; M.A. California 1952. The functionalist interpretation of the labor movement. 1956. *California.*

WILLIAM G. HOSKING, B.A. Hobart 1947; M.S. Cornell 1949. Study of short-run wage determination in the construction industry: six labor markets. 1955. *Cornell*

WAYNE E. HOWARD, B.S. Pennsylvania 1943. The application of seniority provisions in promotion and demotion. 1957. *Pennsylvania*

GEORGE W. JAMES. Stability of the wage share of national and industry income with application of the non-parametric test for trends. 1955. *Georgetown.*

RALPH JAMES, B.A. Oberlin 1950; M.S. Wisconsin 1951. Labor opposition to rationalization of the cotton textile industry in India. 1956. *Cornell.*

PAUL V. JOHNSON, B.S. Purdue 1952; M.S. 1953. Democracy and the decision-making process under collective bargaining. 1955. *Western Reserve.*

LEMUEL R. JORDAN, B.A. Amherst 1947; M.A. Columbia 1949. Labor force as a factor in industrial location in the southeast. 1956. *North Carolina.*

PAUL G. KEAT, B.B.A. City (New York) 1949; M.A. Washington (St. Louis) 1950 Changes in occupational wage structure in the wood-using industries. *Chicago.*

IMTIAZ A. KHAN, B.A. Christian 1950; M.A. Punjab 1952. A study of the mediation of labor disputes in the United States. 1956. *Kansas.*

ROBERT E. L. KNIGHT, B.A. Harvard 1948. Trends in labor relations within the San Francisco Bay area 1919-1940. 1957. *California.*

JOHN W. LOWE, B.S. Arizona State Teachers 1947; M.S. Wisconsin 1948. Union responsibility in a full employment economy. 1956. *Florida.*

JOHN F. LUBIN, B.B.E. New York 1947; M.S. Mass. Inst. of Tech. 1949. Clerical unionization. 1957. *Pennsylvania.*

LEON E. LUNDEN, B.A. Queen's College 1951; M.A. Wisconsin 1952. Collective bargaining patterns in the Wisconsin automobile parts industry. 1955. *Wisconsin.*

MELVIN LURIE, B.A. Pennsylvania State 1948; M.A. Chicago 1951. The effect of unionization on wages in the transit industry. *Chicago.*

THOMAS A. MAHONEY, B.A. Wabash 1950; M.A. Minnesota 1951. Analysis of some relationships between labor mobility and wage differentials. 1955. *Minnesota.*

PHILLIP D. MCCOURY, B.A. Reed 1948; M.A. Duke 1950. Some aspects of pressure group tactics of the operating brotherhoods. 1956. *Duke.*

I. JAMES PIKL, B.A. Wyoming 1949; M.A. 1950. Labor union intervention in product markets. 1955. *Vanderbilt.*

JAMES J. RIDGE, O.S.B., B.A. St. Anselm's 1939; M.A. Catholic 1953. The labor policies of Bishop Francis J. Haas. 1957. *Catholic.*

HAROLD ROSEN, B.A. Newark (Rutgers) 1939; M.A. New York State 1942. The utilization of technicians as a means of meeting the current shortage of professional personnel in American industry. 1956. *American.*

CHARLES SOLTIS, B.A. Duquesne 1948; M.A. Pittsburgh 1949 Implications of the guaranteed annual wage in the steel industry. 1955. *Pittsburgh.*

R. S. STOCKTON, B.S. in M.E. Kansas 1945; B.S. in Bus. 1947; M.B.A. Harvard 1950. The influence of wage surveys in wage policies of Ohio manufacturers. 1956 *Ohio*

CHARLES W. UHLINGER, B.S Hofstra 1941; M A. Columbia 1948. The Wages of seamen. 1956. *Fordham.*

HARCHARAN LAL UPADHYAYA, B.S. Agra (India) 1945; M.A. 1950. Cotton textile wages and working conditions in India. 1956. *Wisconsin*

CHARLES W. VEAR, B.A. Indiana 1952; M.A. 1952; M.A Fletcher School Law and Diplomacy 1953. Organized labor and the tariff. 1955. *Fletcher School Law and Diplomacy.*

WILLIAM D. WOOD, B.A. McMaster 1950; M.A. Queens 1953. An analysis of office unionism in Canadian manufacturing industries. 1955. *Princeton*

Population; Social Welfare and Living Standards

Degrees Conferred

HARRY E. ALLISON, Ph.D Harvard 1955 An analysis of a consumer panel as a source of demand study data.

DAVID P. DELORME, Ph.D. Texas 1955. A socio-economic study of the Turtle Mountain Band of Chippewa Indians and a critical evaluation of proposals designed to terminate their federal wardship status.

KENNETH W. MASTERS, Ph.D. Pennsylvania 1955 Population redistribution in the United States, 1840–1860.

THOMAS MAYER, Ph.D Columbia 1953. The population argument of the stagnation thesis in the United States.

VILAS J. RHODES, Ph.D. Harvard 1955. A theoretical and empirical investigation of consumer preferences for beef by grades in metropolitan St. Louis, 1954.

THOMAS C. SANDERS, Ph.D. Virginia 1955. Administrative financing and the future growth of the employment security program.

EDWARD R. SOPIARZ, Ph.D. Wisconsin 1955. The level of consumption and the standard of consumption and the consumption function.

CHARLES J. ZWICK, Ph.D. Harvard 1955. A study of the demand for meat.

Theses in Preparation

JOHN A. BOTTOMLEY, B.A. British Columbia 1951. Living standards among the Tanganyika natives. 1956. *Virginia.*

WALTER W. DOTTERWEICH, B.B.A. Upsala 1951; M.A. Pennsylvania 1952. Medical and hospital benefits for the aged. 1956. *Pennsylvania.*

ROBERT W. DVORSKY, B.S. Ohio 1937; M.Ed. 1948. Voluntary health insurance plans. 1956. *Pittsburgh.*

HARVEY N. JOHNSON, B.A. Virginia Union 1937; M.P.A. New York 1947. An analysis of problems and practices involved in the administration of federal public housing legislation by local authority personnel in the United States. 1956. *New York.*

VERNON G. LIPPITT, B.S. Mass. Inst. of Tech. 1938; M.S. 1939; B. Phil. Oxford 1948. Determinants of consumer demand for house furnishings and equipment. 1955. *Harvard.*

MICHAEL S. MARCH, B.A. Colorado 1939. Special veterans' benefits programs and their relationship to the general social security program. *Harvard*

JONAS E. MITTELMAN, B.S. Buffalo 1952; M.B.A. 1953. The vesting of private pensions 1956. *Pennsylvania.*

BURTON WEISBROD, B.S. Illinois 1951; M.A. Northwestern 1952. The economic value of improvement in public health. 1956. *Northwestern.*

VACANCIES AND APPLICATIONS

The Association is glad to render service to applicants who wish to make known their availability for positions in the field of economics and to administrative officers of colleges and universities and to others who are seeking to fill vacancies.

The officers of the Association take no responsibility for making a selection among the applicants or following up the results. The Secretary's Office will merely afford a central point for clearing inquiries; and the *Review* will publish in this section brief description of vacancies announced and of applications submitted (with necessary editorial changes). Since the Association has no other way of knowing whether or not this section is performing a real service, the Secretary would appreciate receiving notification of appointments made as a result of these announcements. It is optional with those submitting such announcements to publish name and address or to use a key number. Deadlines for the four issues of the *Review* are February 1, May 1, August 1, and November 1.

Communications should be addressed to: The Secretary, American Economic Association, Northwestern, University, Evanston, Illinois.

Vacancies

Private and public finance: Ph.D. with emphasis in private and public finance for a large coeducational Catholic university in the Midwest, beginning in fall, 1955. Prefer man with some institutional and some teaching experience. P170

International travel opportunity: The Council on Student Travel invites applications for short-term employment as educational directors on trans-Atlantic ships. Required: educators from the following fields: cultural anthropology, art history, international relations and economics, group work, language, philosophy, recreation, sociology. Conversational ability in one or more of the following: French, German, Greek, Italian. Ability to organize extensive educational program with the help of passenger volunteers. From March to December, 1955, the program will be conducted by the Council for students, tourists and migrants traveling aboard two large passenger ships belonging to one of the major lines. These ships sail regularly from New York to European and Mediterranean ports Job assignments vary from one round-trip sailing to periods of 3-5 months Compensation for these longer periods of service will be regular salary For a single round-trip sailing, full or partial passage, depending upon job requirements. All positions allow for time abroad. For further information, application form, write to. Council on Student Travel, (0-1), 179 Broadway, New York 7, N.Y. REctor 2-0936.

Business administration: Instructor or assistant professor, small Catholic co-educational college in large metropolitan, midwestern center. Salary four to five thousand depending upon qualifications. Should be able to teach management and general business subjects. Ample opportunity for consultation or other outside work if desired. P175

Positions Available at

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Economic Scientist: For continuing advanced research on money-credit and business cycle problems. Should have some knowledge of National Bureau's as well as our work in this area and a background of research. Ph.D. not required provided record of past achievements satisfactory. Successful applicant could be someone still working on Ph.D. thesis or older man who has had extensive experience in the field. Work includes primarily advanced research, some writing, and some seminar guidance of graduate students; no undergraduate teaching. Salary proportionately better than those usual in academic life, because this position requires continuing work entire year except annual 3-week vacation. Unusual long-run opportunity for professional achievement.

Philosopher Scientist: Must be thoroughly grounded in Pierce-Dewey-Bentley line of advance; preferably some experience in analysis of methods evidenced in work of various economists. Job includes continuing critical analysis and basic reconstruction in economics extending Dewey and Bentley's *Knowing and the Known* into description of economic behavior. Some seminar guidance of graduate students in semantics, logic, and the philosophy of scientific method; no undergraduate teaching. Salary proportionately better than those in academic life, because this position requires continuing work the entire year except annual 3-week vacation. Unusual long-run opportunity for professional achievement.

Investment Division: Man qualified in corporate finance, industry studies, accounting, including ratio anaylsis, and investments for our Investment Division. A mature and experienced individual who might be expected to head this aspect of our work in a year or two is sought. This Division prepares the Institute's *Investment Bulletin* and supervises about 200 accounts of individuals; its work is growing rapidly. Some seminar work with our graduate fellows also would be involved.
Note: We wish to find the best men available for the above positions, which are to be filled either this year or in the summer of 1956. Arrangements will be made for conferences with those selected for final consideration. Please send complete statement of education and experience.

Economists Available for Positions

Industrial surveys, personnel management, market research, international economics: Man, 36, Ph.D. Extensive experience with industry, government, advertising, foreign intelligence; various teaching positions; publications; supervisory, editorial, public relations, and lecturing experience. Several foreign languages. Presently employed in New York City headquarters of an international organization. Interested in more responsible position with industrial, commercial company or large university. E450

Business cycles, economic development, public control, transportation: Man, 36, M.A., Ph.D. Ten years of teaching experience at leading institutions; 5 years in industry. Broad familiarity with manufacturing and transport industries; good publication record. Desires teaching and/or research. E528

Economic principles, labor, economic thought, economic history, economic systems, corporation finance, marketing, money and banking: Man, A.M., Northwestern University. Ph.D., Yale University. Fifteen years of economics teaching experience; government experience as price economist. Broad social science background. Project in American economic field completed. Available in September. E536

Economic history, business history, insurance history: Man, 36, Ph.D., New York University. Fourteen years of governmental experience, including those of an advisory and administrative nature; 1 year of teaching experience. Has considerable counseling experience. Desires research, writing, or teaching position. Interested especially in college or university teaching position. Of especial usefulness to life insurance companies as research assistant or historian. E553

International trade, money and banking, investments, market research, labor economics: Man, married; Ph.D. expected this spring. Three years of university teaching numerous fields in economics; 7 years of government research experience in cost and statistical analysis, interindustry relationships, price studies, and labor relations. Interested in teaching position or opening in private industry in management, sales engineering, or foreign trade. Available immediately. E562

International trade, comparative economic systems, urban land economics, marketing, history of economic thought, public finance, money and banking, economic history of Europe: Man, Ph.D. Research fellowships; 7 years of university and college teaching; 4 years of research in federal government. Experience as consultant; multilinguist; extensive foreign travel. Desires teaching or research position. E563

Economic theory, statistics, accounting, money and banking, private and public finance, mathematical economics, international trade: Man, 35; B.S., M.A., Harvard, plus 2 years of graduate study on economic theory and statistics. Now assistant professor of economics and special lecturer of statistics; 6 years of successful college teaching experience. Other experiences include federal government position, university and industry research. Desires better teaching position or responsible statistical research position. E564

Economic history, history of economic thought, economic theory, money and banking, business cycles, international trade and economics, economic geography, corporation finance, investments, marketing: Man, 30, Ph.D., Rotterdam. Has some teaching, industrial, and marketing experience and excellent references. Desires teaching, research, or advisory position in California (San Francisco area). E565

Investment analysis, auditing, budgeting, business finance: Man, 51, J.D. Twelve years of experience in banking, credit and investment transactions; 5 years of experience in auditing large European organizations; 13 semesters of teaching experience as a professor in a fully accredited university in the U.S. Desires position as an investment analyst, controller, or treasurer. Also interested in teaching position. E572

Beginning economics, economic geography, money and banking, credit, retailing, marketing, public utilities: Man, B.S., M.S., plus year of advanced study. Thirty years of experience in teaching and research work; 28 years of teaching in one institution. Being retired under faculty service ruling. Available for part-time, visiting, or supply instructor. Available in September. E573

Economic principles, money and banking, public finance, corporation finance, investments, business cycles, international economics: Man, 37, single; B.S., M.A., requirements for Ph.D. completed and dissertation in progress. Ten years of business experience in commercial banking and insurance underwriting; 2 years of teaching experience at outstanding midwestern schools; currently chairman of department of economics and business at a leading midwestern college. Desires a change to a better position offering greater opportunities for research and development. Stimulating teacher and public speaker. Partial to Southwest (Arizona) or West Coast location. E574

Business statistics: Man, 44, married; Ph.D. Teaching experience in economics and business administration; publications and convention speaking; active in research and consulting. Now teaching in university. Seeks position with greater responsibility. E576

Economic theory and principles, history of thought, public and private finance, and other subjects: Man, under 40, prewar Ph D. Experience in banking, research, government. Listed for years in regional *Who's Who;* contributor to leading journals; trade book on economics of baseball just published; several other books in progress, including theory textbook, but stimulating teaching is chief interest and qualification. Taught 18 years at graduate and undergraduate levels, in several fields, mainly economic theory and finance; 12 years as associate professor; 8 years in present position at large university, with tenure Minimum full professorship. Available now or will negotiate for near future E580

Soviet economy, price theory, national income analysis, economic history, international trade: Man, 34, married; Ph.D. Experience: 4 years of engineering in industry, 2 years of interdisciplinary survey research work at large university, 1 year of inter-industry research with private corporation, 1 year of teaching. Publications. Interested in teaching-cum-research position. E582

Professional economist and statistician: Man, 42, married; graduate work at University of Chicago but Ph.D. thesis incomplete. Taught 4 years at Ohio State University; 9 years of experience with U.S. government, including OPA and Bureau of the Budget; 2½ years in Economic and Scientific Section, SCAP (Japan). Just returned to U.S. after 7 years in Japan and Far East; last 5 years as founder and director of private economic consulting office in Tokyo, representing various U.S. economic and engineering firms and handling cases for U.S. and Japanese clients involving loans and investments, technical assistance contracts, foreign trade, market surveys, and economic research analysis. Brief economic survey experience for Burma and South Korea. Speaks, reads, and writes German; reads French; fair to good understanding and speaking knowledge of Japanese. At present completing economic consulting assignment for National Planning Association as Japan expert for the Survey of Peacetime Uses of Atomic Energy (to be published). Other writings in field of economic forecasting, national income and expenditure analysis, economic and industrial planning. E583

Labor, finance, theory, doctrines, et al.: Man, married; Ph.D. Forty years as full professor; retired; listed in *Who's Who in America.* Will supply full or part time for one on leave for semester or academic year. E584



THREE TELEPHONE PIONEERS from different sections of the country are Robert C. Price of Williamsport, Pa.; Mrs. Marguerite T. Burns of Minneapolis, Minn.; and Melvin F. Held of St. Louis, Mo. Thousands of telephone people belong to the two Pioneer associations.

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